Memorymoog Factory Service Bulletin (FSB) History

Bulletin#	Date	Title	Serial<=	Factory Parts?	Prerequisite FSBs	Power Supply	LSC	RSC	DMUX	Digital	Common Analog	Contour
Summary			Various			☑	☑	☑	☑	☑	☑	☑
834	11/16/83	Footpedal Input Modifications	2000								☑	
835	11/22/83	Fix for spontaneous Pot Edits	1795					☑				
			2531					☑				
			3000						☑			
836	6/15/83	Eliminate LFO audio bleed	All								☑	
837	11/11/83	Pitch Bend Amt Modification	2531								☑	
838A	11/17/83	Power Supply "Crazy Memorymoog"	1440							☑		
			3000			☑						
839A	11/11/83	Switch Repair	2532				☑	☑				
840	10/6/83	Autotune Update Non-Plus	2732	☑	834, 837, 838				☑	☑	☑	
841A		Sequencer/MIDI upgrade		☑	834, 835, 837, 838, 840				☑	☑	☑	
841B	1/18/83	Sequencer/MIDI upgrade	3000	☑	834, 835, 837, 838		☑		☑	☑	☑	
842A	1/18/84	Noise Source Improvement	All								☑	
843	4/10/84	Mono/Transpose/Hold CV Modification	All								☑	☑
844	2/24/84	Replacement Fan	All	☑								
845	5/9/84	Pitch Wheel Spring Return	All	☑								
846	8/16/84	Alphanumberic Display	All	☑			☑					

moog®

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

MEMORYMOOG BULLETIN SUMMARY

This summary provides a guide to implementing all of the bulletins associated with Memorymoog updating, to to and including the Sequencer/MIDI. Since the work outlined in each of the bulletins may be individually performed, this guide may help insure more efficient use of your time by combining various work operatings, i.e., while one particular assembly is being updated or modified, all other applicable changes can be accomplished simultaneously.

* CUSTOMER PROGRAMS
  - o Save customer programs on cassette as they may be lost when the Digital Board is modified.

* FRONT PANEL TEST
  - o Turn ON Memorymoog and hit: (Record Interlock) (C) (0) (ENTER) (A).
  - o Observe that all LED's are on with the exception of AUTOTUNE and one LED on the LHC OCTAVE switches Also observe that the MOD RATE LED flashes. Toggle LHC OCTAVE switches and verify that both LEDs light. Hit RECORD INTERLOCK. Note front panel LEDs return to normal operating status. Hit AUTOTUNE and observe all LEDs are off except for the AUTOTUNE LED and MOD RATE LED.
  - o Check alpha/numeric display in various modes to insure that no characters or segments are out. For example, observe power up display, potentiometer edit of the noise level and the prompts of (C) (3) (ENTER).
  - o If any LED or an alphanumeric segment fails to operate, make a note and replace it when the front panel boards are out for modifications.

* OPEN INSTRUMENT
  - o Remove power supply and modify according to Bulletin 838 but DO NOT REINSTALL POWER SUPPLY AT THIS TIME.
  - o Remove LEFT and RIGHT SIDE CONTROL BOARDS (after checking LEDs as above).
  - o Modify according to Bulletins 835 and 839.
  - o If Sequencer update is being installed at this time, perform additional modifications on LSC board according to Bulletin 841B.
  - o Reinstall LSC, RSC and Power Supply.

* CHECK JACK BOARD FOR THE FOLLOWING AND INSTALL PARTS WHERE NECESSARY:
  - o 470 to 510 pf capacitor soldered between Pins 6 and 7 of U1.
  - o .01uf capacitor soldered between Pins 4 and 8 of U1.
  - o If Sequencer update is being installed at this time, install additional .1uf capacitors on the appropriate jacks according to Bulletin 841B.

* CHECK ALL VOICE CARDS FOR THE FOLLOWING:
  - o C26 should be a .22uf NON electrolytic capacitor. R83 should be a 10K resistor (parallel with 10K if necessary).
  - o U1, U5, U8, the Curtis 3340 VCO's, should NOT have a date code of 8226 (any replaced 3340's REQUIRE 24 hours of burn-in before final calibration).

* CHECK THE CONTOUR GLIDE BOARD FOR THE FOLLOWING:
  - o C2, C5, C8, C11, C32, C43, C54, C65, C76, C88 must be ceramic capacitors (tubular or disc) with any value ranging between .0047 and .01uf.

moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · Cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.

* CHECK THE COMMON ANALOG BOARD FOR THE FOLLOWING:
  - o Modifications pertaining to Bulletins 834 and 837.
  - o If the Autotune update is being accomplished at this time, perform the additional modifications contained in Bulletin 840.
  - o If Sequencer update is being installed at this time, perform the additional modifications contained in Bulletin 841B.
  - o Also check for a .01uf ceramic (disc or tubular) capacitor soldered to the rear side of R81 and R82 and a .01uf ceramic (disc or tubular) capacitor soldered between pins 1 and 14 of U1 (on the bottom of the board).

* CHECK THE DIGITAL BOARD FOR THE FOLLOWING:
  - o Battery leads connected to the board via flexible stranded wire.
  - o The heavy green ground wire soldered between U22 and U29 should exit to the REAR of the board and be as short as possible with NO residual flux left on the board. Remove residual flux by scraping with a small screwdriver. DO NOT use a chemical flux remover.
  - o R14 should be paralleled with a 10K resistor or replaced with a 6.8K resistor (Bulletin 838).
  - o If the AUTOTUNE update is being installed at this time, perform the additional modifications contained in Bulletin 840.
  - o If the SEQUENCER update is being installed at this time, perform the additional modifications contained in Bulletin 841B.

* CHECK DMUX BOARD FOR THE FOLLOWING:
  - o Determine if the .001uf capacitor modification Bulletin 835 is installed correctly.
  - o If AUTOTUNE update is being installed at this time, perform the additional modifications contained in Bulletin 840.

* CHECK SEQUENCER BOARD (BEFORE INSTALLATION) FOR THE FOLLOWING:
  - C10 should be .001uf.
  - R20 should be 150K.
  - R22 should be 1K.
  - Cut top side trace to U13 Pin 5 and solder a 51K resistor across the trace cut and add a .1uf capacitor from Pin 5 to Pin 4 OF U13 on back of board OR from Pin 5 side of 51K resistor to the ground side of C13.

* CHECK WIRING HARNESS FOR THE FOLLOWING:
  - o Inspect transformer wires for cuts, i.e. black, blue, brown, red, grey, yellow wires, and repair as necessary. Secure the wires of the power switch to the wires from the power receptacle with a tie wrap. This avoids interference with the transformer on assembly and disassembly.
  - o Reroute wires from LHC octave switches and wheels AWAY from the left side of the housing (see Bulletin 841B).
  - o Relocate the plastic mounting clip securing the HEADPHONE jack cable from the right side of housing to the mounting stud for RSC board next to FILTER CONTOUR RELEASE pot (see Bulletin 841B).

moog®

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: BULLETIN ADDENDA

DATE May 8, 1984

BULLETIN 838A

"SOLUTION" Section, 3rd Paragraph 8th line:
Perform the "REINFORCMENT PLATE" procedure at this point, BEFORE "Add additional heat sink...".
This updates the procedure so the the POWER SUPPLY does not have to be removed twice.

"BATTERY" section, Add the following sentence at the end:
The battery leads do not have to be paralled if the battery already has flexible jumper wires on it.
See the battery pictorial for details.

"POWER SUPPLY" pictorial:
Replace the three star washers under the three coupler plate screws with the three split lock washers provided, part number 904-041395-008.

"BRACE PLATE" pictorial:
Change part description 3) to read:
3) 6-32 X 1/4" machine screw 812-045039-004

BULLETIN: 839A

"SUBJECT" PART NUMBERS
Correct part numbers are:
Spring "Bridge" Contact P/N 960-045861-001
Contact Burnishing tool P/N 933-045762-001

BULLETIN: 840A

"SUBJECT" section:
Change Software Revision 2.4 to 2.5

"DIGITAL BOARD MODIFICATIONS" section:
Change the EPROM part description to read:

EPROM U2 #1 Version 2.5	Part # 993-045944-125
EPROM U3 #2 Version 2.5	Part # 993-045944-225
EPROM U4 #3 Version 2.5	Part # 993-045944-325

IMPORTANT NOTE:
The following bulletins MUST BE INSTALLED BEFORE BULLETIN 840A is installed:
BULLETIN 834 - FOOTPEDAL INPUT MODIFICATION
BULLETIN 835 - SPONTANEOUS EDITING
BULLETIN 837 - PITCH BEND MODIFICATION
BULLETIN 838 - POWER SUPPLY UPDATE
BULLETIN 839 - SWITCH REPAIR
The above modifications are covered under warranty at any date to the ORIGINAL OWNER ONLY.

BULLETIN: 841B

"REVISION" section:
Change "displays 84" to "displays 85".

IMPORTANT NOTE:
Bulletin 841 (MIDI/SEQUENCER) REQUIRES Bulletin 840 (AUTOTUNE UPDATE) as a prerequisite. The MEMORYMOOG MUST display "83" when C,0,ENTER is keyed in BEFORE the MIDI/SEQUENCER can be installed.

moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS BELOW S/N 2000 (APPROX.) BULLETIN: 834
FOOTPEDAL INPUT MODIFICATIONS

DATE: November 16, 1983 (Supersedes earlier versions)

SYMPTOM: Using the FOOTPEDAL input(s) causes the pitch of oscillator 2's and/or all oscillators to change using the AMOUNT control of FP1 or FP2 WITHOUT having the DESTINATION SWITCHES ON.

Poor tuning stability requiring several hours to tune all six voices - typically displaying "C7" numbers in the low 40's or 50's and rising as the unit warms up. Normally, the "C7" numbers start high (in the 90's or A's) and drop down to the high 70's or low 80's.

CAUSE: Flux contamination around U3 from a factory modification to the "underside" of the COMMON ANALOG board #2.

SOLUTION: 1) Remove U3, bend Pin 2 and Pin 4 out parallel to the body of the IC and reinsert in the socket.

2) Carefully tin the ends of Pin 2 and Pin 4 of U3 using a grounded soldering iron.

3) Cut the back side of R75 flush with the COMMON ANALOG board located immediately to the left of ribbon connector S23, Pin 1. Cut the left side of R113 flush with the COMMON ANALOG board, located to the lower-right of ribbon connector S23.

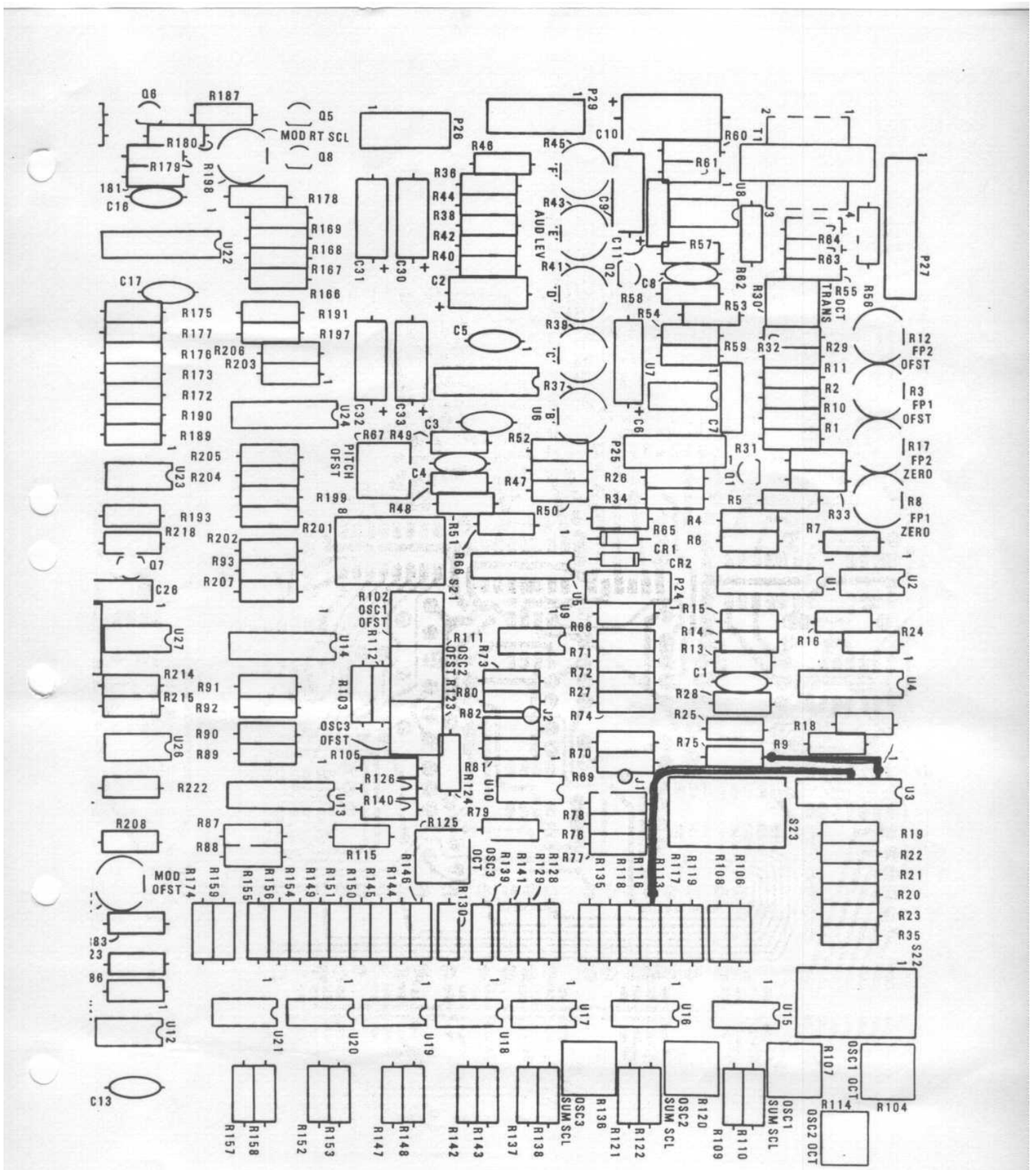
4) Tin the free end of R75 and R113.

5) Tin both ends of a 1" (25mm) and a 2.5" (63mm) insulated jumper wire.

6) Tack-solder the 1" (25mm) jumper wire from the free end of R75 to U3 Pin 2 and the 2.5" (63mm) jumper from the free end of R113 to U3 Pin 4. Use silicone rubber adhesive (i.e. RTV) under the end of each resistor to secure the resistors and to prevent a short to the top side traces.

LABOR: This modification should be performed on ALL units returned for service and is estimated to take 15 minutes. Moog will reimburse at a FLAT RATE of $10.00. The modification is covered under warranty regardless of the warranty expiration date to the original owner.

moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.



COMMON ANALOG
MEMORYMOOG 2
FOOT PEDAL PITCH

moog®

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS BELOW SPONTANEOUS POTENTIOMETER EDITING — BULLETIN: 835

DATE: November 22, 1983 (Supersedes earlier versions)

SYMPTOMS: The alpha-numeric display indicates potentiometer values even though no front panel control has been turned and/or the instrument will immediately indicate potentiometer values when powered up.

CAUSES: Digital to analog ground loop and no +15 volt power supply to U3 on RIGHT SIDE CONTROL board. High frequency HASH on MUX BUSS on DMUX board.

SOLUTION: EDITS ON POWER UP (BELOW S/N 1795)
On an AS REQUIRED BASIS ONLY, add an insulated jumper ON THE TOP (COMPONENT) SIDE of the RIGHT SIDE CONTROL between C14 (side nearest U3) to the jumper over R22 (closest to the edge of board).

NOTE: If this modification is inadvertently soldered to C8 instead of C14, it will cause constant editing and burn out R22, the PW1 pot. THIS JUMPER WIRE MUST BE ON THE COMPONENT SIDE OF THE BOARD.

SPONTANEOUS POTENTIOMETER EDITING (BELOW S/N 2531)
Modify the RIGHT SIDE CONTROL board on the bottom side with the board mounted in place. Cut the trace between C21 and the jumper connected to U6 pin 7. Follow the diagram provided. This is necessary because the digital ground was inadvertently tied to the analog ground, resulting in a ground loop.

Also cut the trace between C14 and the jumper connected to U3 pin 8 at the "1" of the screened information "SYNC 2 TO 1". "Tack-solder" a 1.8" (46mm) insulated jumper between the ground side (mounting tab) of R22 and the C14 side of the trace cut at the "SYNC 2 TO 1" location - follow the diagram provided.

NOTE: ALL FLUX MUST BE REMOVED FROM THE BOARD BY THE JUMPER WIRE, OR THE EDITING PROBLEM WILL WORSEN FROM FLUX LEAKAGE. The solder (back) side of the board should also be checked for flux that may have "run" through the board by the top jumper and C14 and removed if present.

SPONTANEOUS POTENTIOMETER EDITING (BELOW S/N 3000)
On the top (component) side of DMUX board #5 carefully tack-solder a .001uf (any style) capacitor from the left side of R19 (1K, located immediately to the right of U6, Pin 6), to the large (analog) ground trace labeled "U5". Use insulated sleeving or silicone rubber (i.e. RTV) to prevent the capacitor leads from shorting to top traces. CHECK FOR AND REMOVE ANY FLUX.

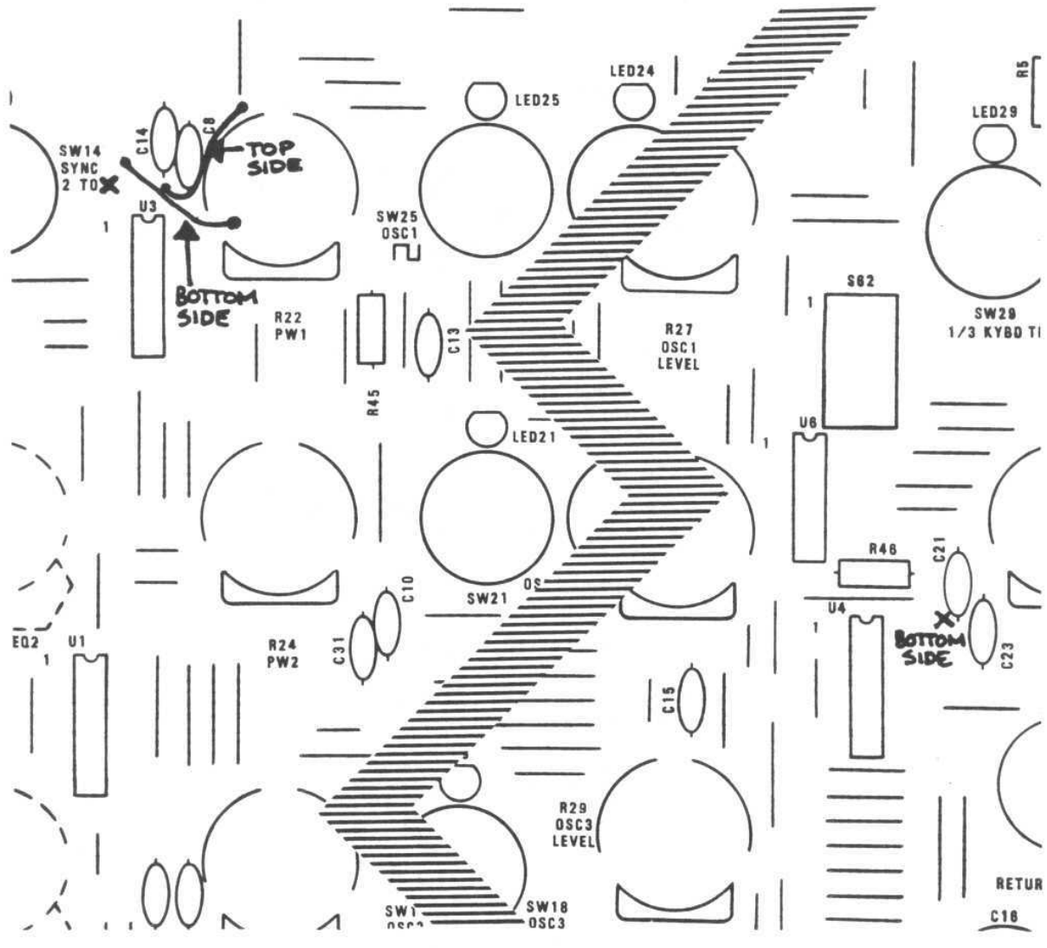
NOTE: Previous versions of this bulletin incorrectly stated that the capacitor be tack-soldered from the left side of R18 (10K, located 1/2" (13mm) behind and to the right of U6), to the front (keyboard) side of C89 (DIGITAL

moog® · Gibson® · MAESTRO® · cordovox® · Epiphone® · LABSERIES™ · SG®
Synthesizers Amplifiers Sound Modifiers Accordions Amplifiers Amplifiers

ground). Therefore, if it is present, cut it out with diagonal cutters (DO NOT unsolder it) and add a new .001uf capacitor as above. THIS MAY CAUSE editing due to normal digital ground noise being AC coupled into the MUX BUSS by the capacitor.

DOCUMENTATION: Update the customer's L.S.C. #7 schematic by changing the ground on U6 pin 7 from an analog ground to digital ground symbol and draw in a .001uf cap from Pin 3 of U6B to analog ground on the DMUX #5 schematic.

LABOR: These modifications (except EDIT ON POWER UP) should be installed on ALL units returned for service and is estimated to take 20 minutes. Moog will reimburse at a flat rate of $15.00 per instrument. The modification is covered under warranty regardless of the warranty expiration date to the original owner.



R.S.C. PRINTED CIRCUIT BOARD SCHEMATIC (BOARD NO. 6)

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS - ALL SERIAL NUMBERS — BULLETIN: 836
LFO CLICKING

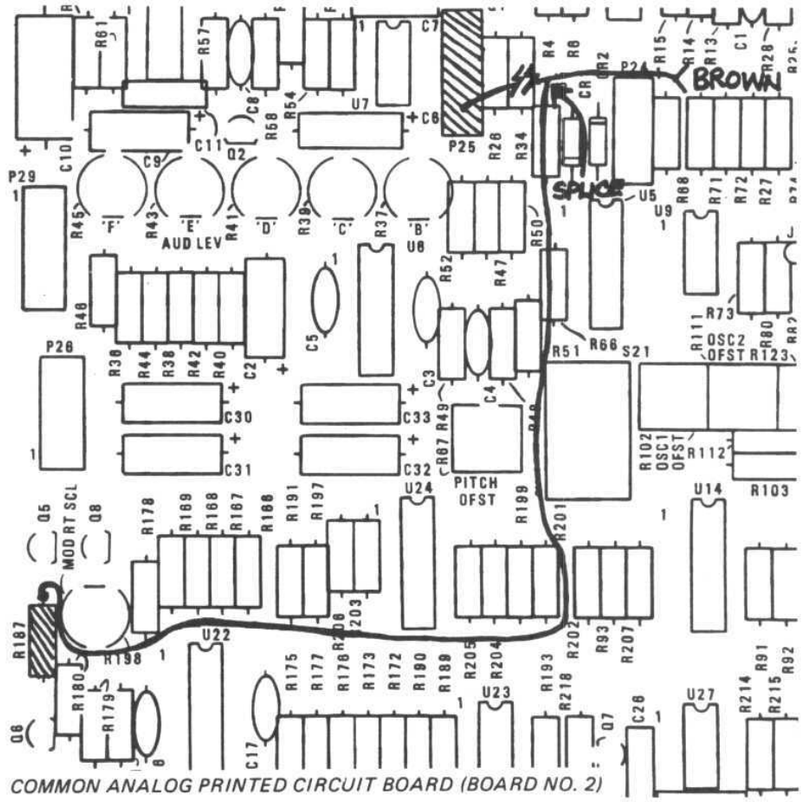
DATE: June 15, 1983

SYMPTOM: LFO click bleedthrough at LFO modulation RATE. This is normally reported in studio usage of the Memorymoog.

CAUSE: The LFO switching line is capacitively coupled to the Audio output, due to the circuit board layout of the COMMON ANALOG BOARD.

CURE:
1) Cut the rear end (P26 side) of R187, the 220 ohm resistor, flush with the COMMON ANALOG BOARD and tin this end of the resistor.
2) Cut the brown wire at MTA connector P25 Pin 6.
3) Solder a 5" insulated jumper wire from the brown wire to the free end of R187.

LABOR: This modification is to be performed on an as required basis and is not covered under warranty. The estimated modification time is 15 minutes.



COMMON ANALOG PRINTED CIRCUIT BOARD (BOARD NO. 2)

MEMORYMOOG 2 COMMON ANALOG

Synthesizers · Amplifiers · Sound Modifiers · Accordions · Amplifiers · Amplifiers · Amps.

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS BELOW S/N 2531 — BULLETIN: 837
PITCH BEND AMOUNT MODIFICATION
PARTS TO BE PURCHASED LOCALLY

DATE: November 11, 1983 (Supersedes earlier versions of Bulletin 837)

SYMPTOMS: Tuning changes from preset to preset, caused by different programmed PITCH BEND AMOUNTS which detunes all the oscillators.

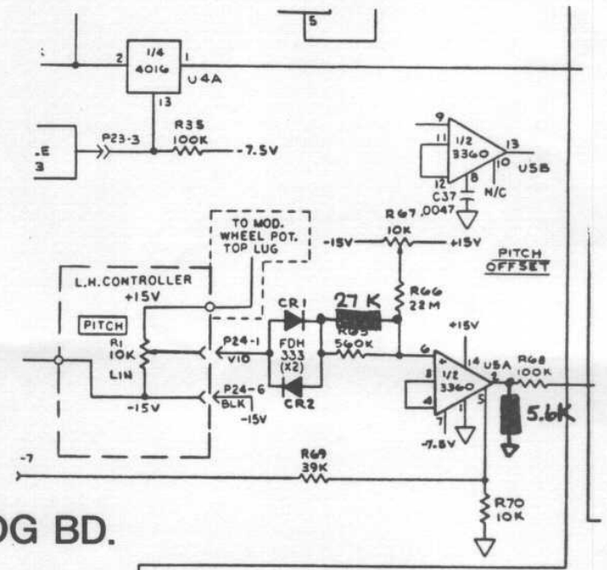
CAUSE: The PITCH BEND VCA U5A on the COMMON ANALOG BOARD develops a non-linear output offset current which varies with the control voltage on Pin 5. This modification greatly improves linearity.

SOLUTION: 1) Tack-solder across R65 (560K) a 27K 5% resistor, part number 852-312273-001, on the TOP (component) side of the COMMON ANALOG BOARD.

2) Tack-solder a 5.6K 5% resistor, part number 852-312562-001, from the front side (U9 side) of R68 (100K) to the front side of R27 (4.99K).

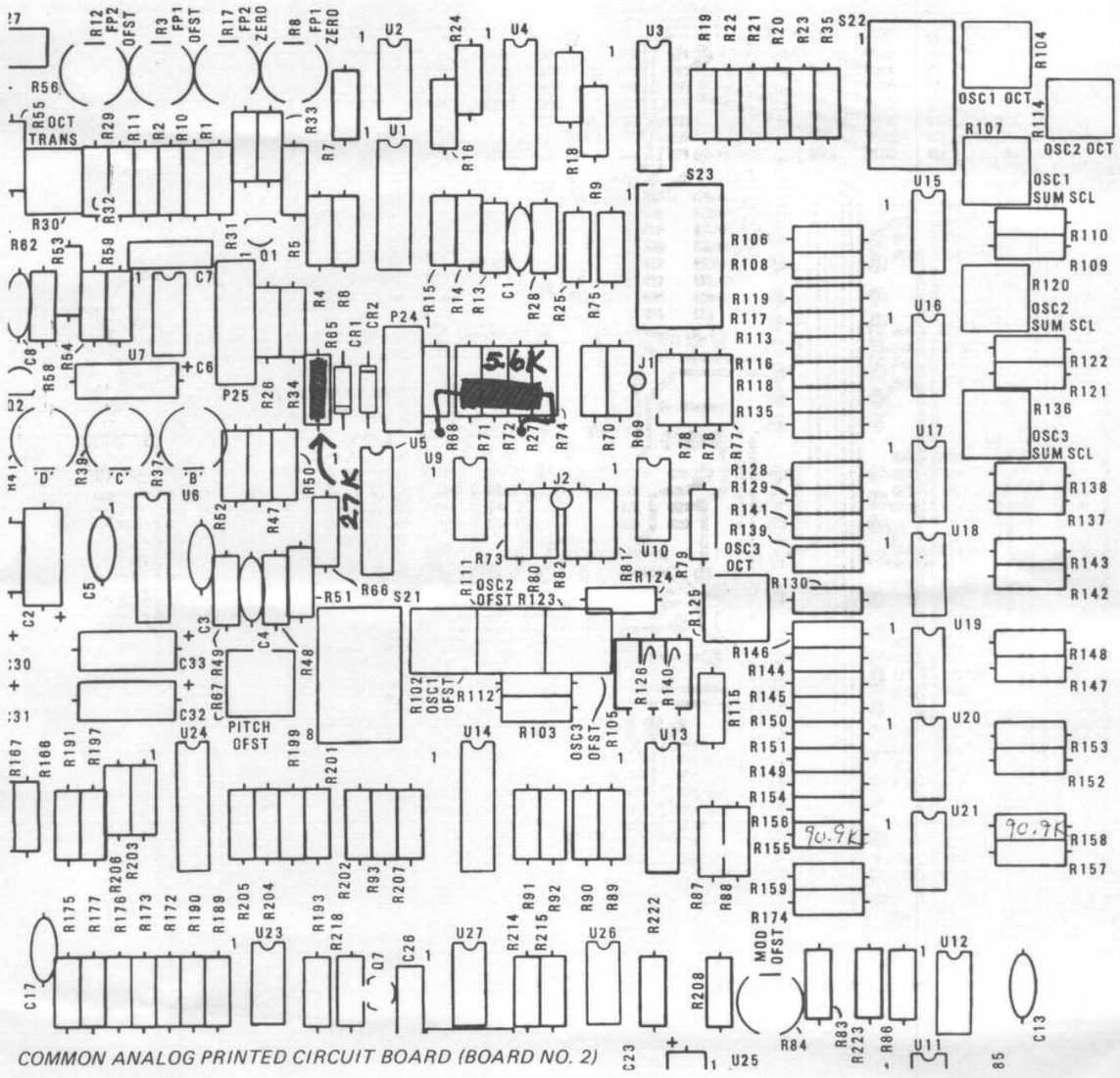
DOCUMENTATION: Update the customer's COMMON ANALOG schematic:
1) Draw in a 27K resistor across R65.
2) Draw in a 5.6K resistor from Pin 2 of U5A to ground.

LABOR: This modification is to be performed on all units returned for service and is estimated to take 15 minutes. Moog will reimburse for this modification at a FLAT RATE of $10.00. This modification is covered under warranty regardless of the warranty expiration date to the original owner.



COMMON ANALOG BD.

moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.



COMMON ANALOG PRINTED CIRCUIT BOARD (BOARD NO. 2)

COMMON ANALOG
MEMORYMOOG 2
PITCH BEND

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS BELOW S/N 3000 — BULLETIN: 838A
POWER SUPPLY UPDATE
Kit P/N 997-044696-001

DATE: November 17, 1983 (Supersedes earlier versions)

SYMPTOMS: Memorymoog "LOCKS UP" - no sound and no controls or switches function. Locks up in preset 88 and "**MOOG**" is displayed. "Dumps" from one to 100 presets. Locks in AUTOTUNE with all displays blanked out.

Tuning of all oscillators is flat or sharp by several semitones.

Vibration causes the Memorymoog to edit into potentiometer settings or the Memorymoog continuously edits.

CAUSE: The power supply pass transistor leads are oxidizing and moving relative to the sockets mounted on the circuit board (fretting corrosion of contacts). Excessive stress to the main connector after final assembly.

Flux at digital board ground.

Intermittent short circuit of harness from Left Hand Controller to the power transformer case or the base reinforcing ribs.

SOLUTION: Unplug the four plug-in connectors from the POWER SUPPLY board. Remove the three large phillips head screws which secure the 1/4" coupler plate to the black heat sink. Remove the power supply board and coupler plate by grabbing the power supply board at the top and pulling it forward. NOTE: It is NOT NECESSARY TO REMOVE THE BLACK HEAT SINK. Place the bottom of the coupler plate on a sheet of paper (e.g. legal size envelope).

Remove each pass transistor which is mounted with a small phillips-head screw and unsolder the associated socket. Bend the "ends" of each lead of the transistor as shown and solder it directly to the board. Add the black plastic coupling clamps as shown, Moog part number 964-046113-001. Insure the MICA insulators are correctly repositioned under the pass transistors to avoid short circuits to the heat sink and discard the four shoulder washers. Replace the 4-40 1/4" (6mm) pass transistor mounting screws with 4-40 3/8" (9mm) screws, Moog part number 806-023039-006.

Carefully unsolder and remove the large 15 pin header at the top center of the Power Supply board. Replace it with a 15 pin right angle header, Moog P/N 910-046117-015. Check each of the four pass transistors with an ohm meter for a COLLECTOR (mounting tab or middle lead) to coupler plate short, which indicates a shifted MICA insulator. Clean the male pins of the three 3-pin transformer headers on the power supply board with a pencil eraser. Add additional heat sink compound to the coupler plate (if necessary) and remount the power supply board and coupler plate assembly. Spray the female ends of the four plug-in connectors with contact cleaner (e.g. CRAMOLIN RED) before

moog® · Gibson® · MAESTRO® · cordovox® · Epiphone® · LABSERIES™ · SG®

reconnecting to the power supply board.

The wire harness from the PITCH and MODULATION wheels is tie-wrapped to a nylon clip approximately 9" (228mm) from the wheels. Remove the screw holding the nylon clip in place. Attach the nylon clip to the L.S.C. board mounting stud located near the "ENTER" switch. Inspect this harness for cut or damaged wires and repair as necessary. Reinstall the screw which originally held the nylon clip back into the end cap.

The transformer wires leading to the power supply (two red, two grey and two yellow wires) should be secured together (tie-wrap where necessary) along the first 3" (76mm) of wires exiting the transformer with a large tie-wrap, Moog part number 976-042299-004. A 7-3/4" (197mm) piece of continuous grommet, Moog part number 916-041636-001, should be placed on the right edge of the transformer support bracket underneath these various wires.

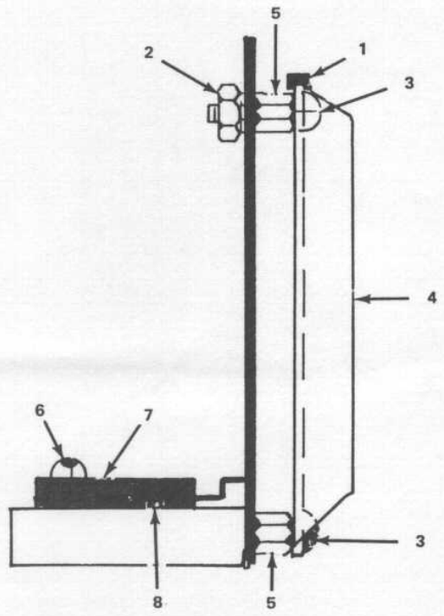
The heavy green ground wire from the DMUX to the Digital Board should be checked for any residual flux on the Digital Board and scrapped away if flux is found. On the Digital Board, resistor R14 should be parallelled with a 10K 1/4 5% resistor to reduce any leakage possibilities from the RAM ENABLE line to ground which can cause "lock-up".

BATTERY: For Memorymoogs prior to serial number 1440, the battery mounting must be checked and modified if necessary. Depending on mechanical tolerances, the bolt head which secures the LEFT SIDE CONTROL board regulator U11 may press against the battery ultimately fracturing the solder connection or lead of the negative side. To prevent this, the regular screw should be replaced with a pop rivet. In addition, the battery should be secured in place with a tie wrap as shown and the battery leads paralleled with the flexible red and black wire provided.

REINFORCEMENT PLATE: To absolutely guarantee that the power supply board will not flex during use, troubleshooting or assembly/disassembly, the following procedure describes how to install a reinforcement plate. This modification is recommended for Memorymoogs below approximately serial number 3000. Remove the three (3) black phillips-head screws holding the Power Supply board to the coupler plate and save for later use. Replace these screws with the three (3) 1/4" brass colored standoffs supplied. Tighten using a 1/4" nut driver or wrench taking care not to damage printed circuit board or snap off the standoff. Add an additional two (2) brass standoffs to the upper part of the printed circuit board and secure in place with two (2) of the #6 keps nuts supplied. Install the reinforcement plate to the standoffs using five (5) black phillips-head screws. Install the 3-1/2" (89mm) plastic extrusion (continuous grommet) to the top edge of the reinforcement plate.

LABOR: This modification is estimated to take 60 minutes, should be performed on ALL units returned for service and will be reimbursed by Moog at a flat rate of $20.00. This modification should be performed in warranty regardless of the warranty expiration date to the original owner.

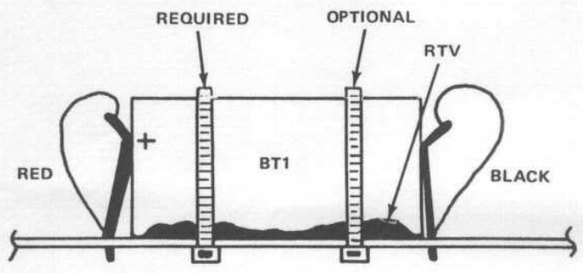
EMERGENCY METHOD: If any customer requires an immediate repair and there is no time to obtain the power supply kit, perform the above procedures using locally available parts. The power supply pass transistors may be turned 90 degrees and wired to the printed circuit board using suitable flexible insulated stranded wire.

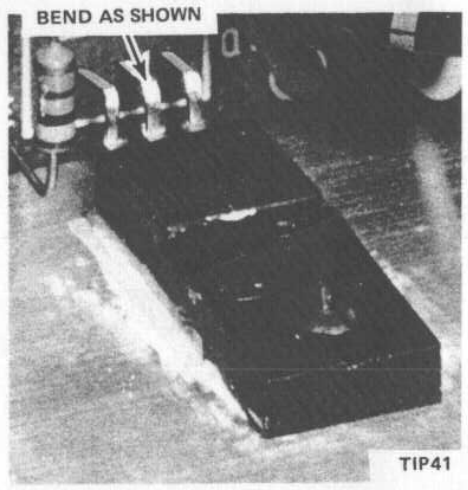


1) 4-1/2" Plastic Extrusion
   916-041636-001
2) 6-32 Keps Nuts
   802-045332-000
3) 6-32 x 5/8" Machine Screws
   806-045039-010
4) Reinforcement plate
   967-046114-001
5) 6-32 x 1/4" Hex Spacer
   973-040517-001
6) 4-40 x 3/8 Machine Screws
   806-023039-006
7) Black Plastic Couplers
   964-046113-001
8) Mica Insulators
   908-042674-001

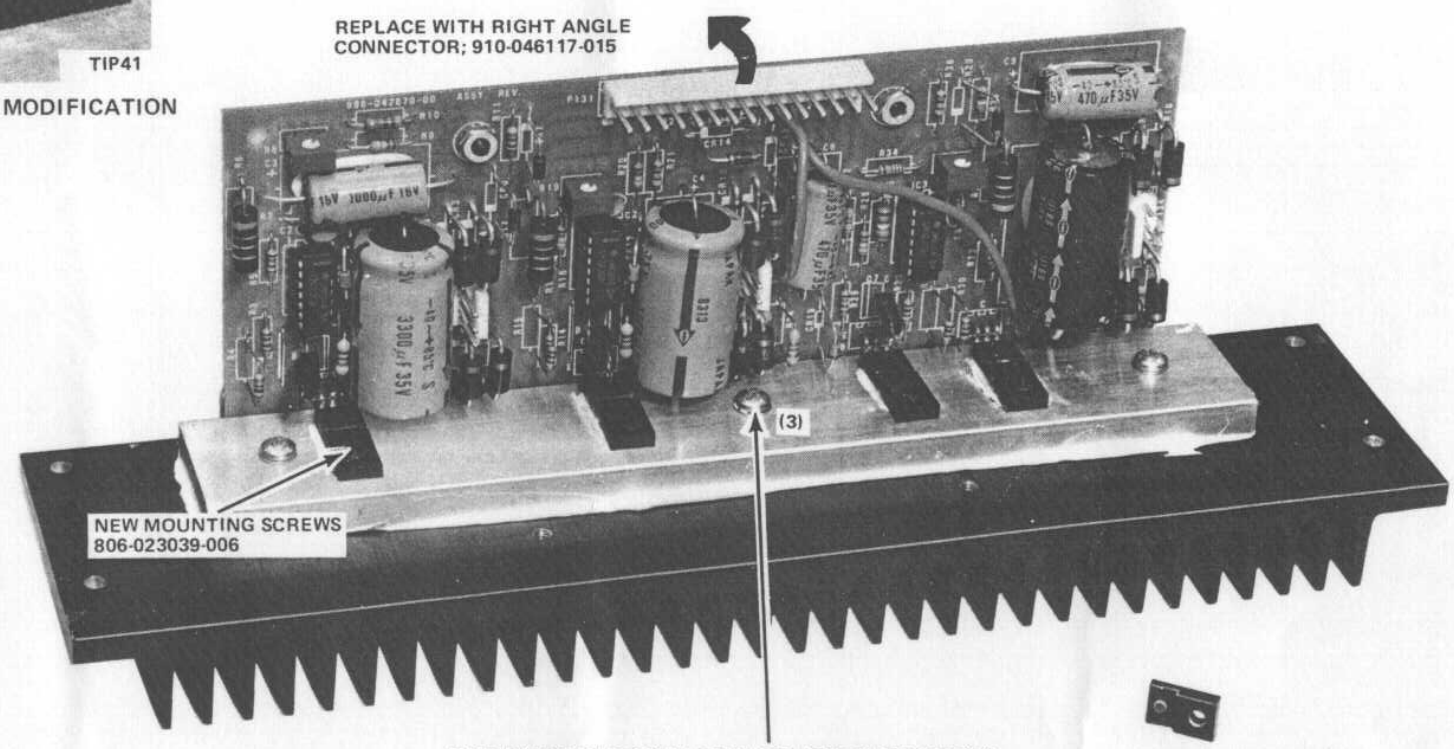
CAUTION:
Bend metal tangs ABOVE spot welds on the battery at a 45 degree angle and solder wires as shown. Make sure ALL power and audio cords are disconnected from the Memorymoog before soldering to battery, otherwise memory loss could result due to an earth ground loop to the positive terminal.

Rev. 1/12/84





POWER SUPPLY TRANSISTOR MODIFICATION



TO DISASSEMBLE COUPLER PLATE, REMOVE 3 SCREWS
TAPE TO AN ENVELOPE AND PERFORM UPDATES

REFORM TRANSISTOR LEADS AND SOLDER TO BOARD
REPOSITION MICA INSULATOR; ADD COMPOUND

NEW BLACK PLASTIC
COUPLER; 964-046113-001

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS BELOW S/N 2532 BULLETIN: 839A
SWITCH REPAIR
Refer to page 134 of Service Manual
Spring "Bridge" Contact P/N 993-045762-001
Contact Burnishing Tool P/N 960-045861-001

DATE: November 11, 1983 (Supersedes earlier versions)

SYMPTOM: Sluggish, intermittent or nonfunctional switches.

CAUSE: Flux, flux by-products (salt), oxides and corrosives on contact surfaces. Insufficient contact current.

CURE: ON AN AS REQUIRED BASIS BELOW S/N 2532:
Disassemble the control boards from the front panel.

CLEAN ALL THE SWITCH CONTACTS WITH A CONTACT BURNISHING TOOL, GC ELECTRONICS PART NUMBER 9338 OR EQUIVALENT (THIN STAINLESS STEEL VERSION OF AN EMERY BOARD). PLACE THE TOOL BETWEEN THE CONTACTS, PRESS THE PLASTIC ACTUATOR BUTTON AND SLIDE THE TOOL OUT. REPEAT TWICE FOR EACH CONTACT.

PROCEDURE: COMPRESSION SPRING REMOVAL
The coiled compression return springs should be removed if they are present. Otherwise, these springs can cause shorts to top side traces. The feel of the switches and ease of assembly are greatly improved without these compression springs.

DO NOT remove the plastic actuator buttons to remove the compression springs. Wear a pair of gloves and use needle-nose pliers to grab the springs in the middle and pull the springs out while holding the plastic actuator in place.

Unsolder the pull-up resistors R1 through R6 on BOTH the RIGHT and LEFT SIDE control boards and replace with with 1K 5% 1/4 watt resistors. This effectively increases the current ten times to each switch contact and promotes a continuous cleaning action of any oxide deposits as the switch is used.

NOTE: ALL FLUX MUST BE REMOVED FROM AROUND THESE RESISTORS, OR AN EDITING PROBLEM WILL RESULT FROM FLUX LEAKAGE.

To gain access to SOME of the contacts for cleaning, the actuator buttons may have to be removed. They are secured to the printed circuit board with enlarged "feet". Remove them without applying any pressure to the associated LED by pushing the "feet" out using a screwdriver handle from the solder side of the board.

Reinsert the plastic actuator button by applying firm, even downward pressure. Be careful not to push too hard or push at an angle causing damage to either the contact or the LED when the button "snaps" through the board.

If no results are obtained from the above method or if there is an awkward feel to the switch action, then the

moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.

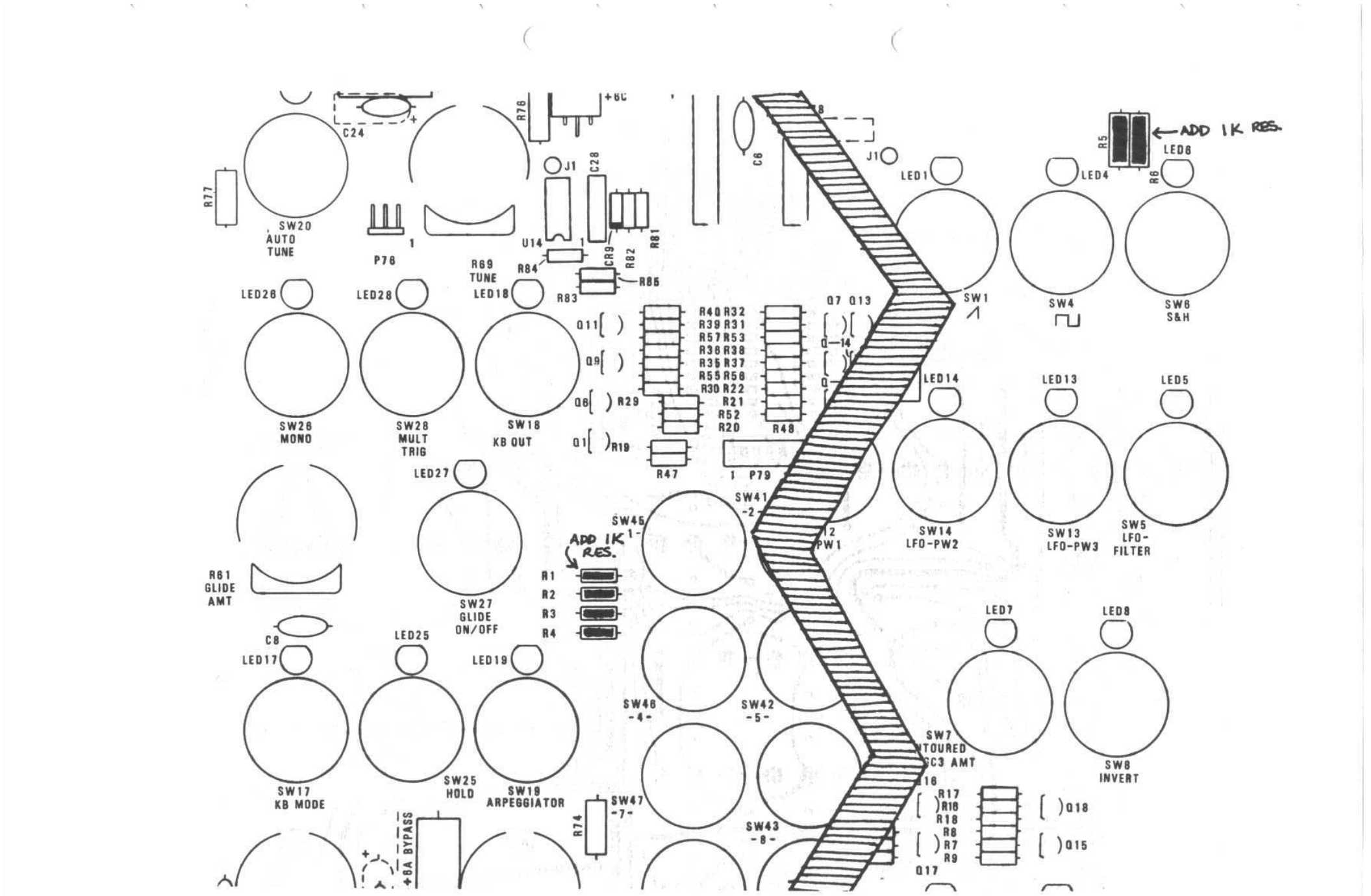
top SPRING "BRIDGE" CONTACT should be carefully removed using a desoldering tool and replaced. Once the contact is removed, the center button (pin) contact should be cleaned using a soft pencil eraser. Any hardened flux on the board near the contact should be scraped away, rather than using a chemical flux remover which may spread flux on the board surface.

A new contact should be inserted into the board by pushing ONLY ON THE END TABS (stem). Pressure on the center will destroy the spring characteristics.

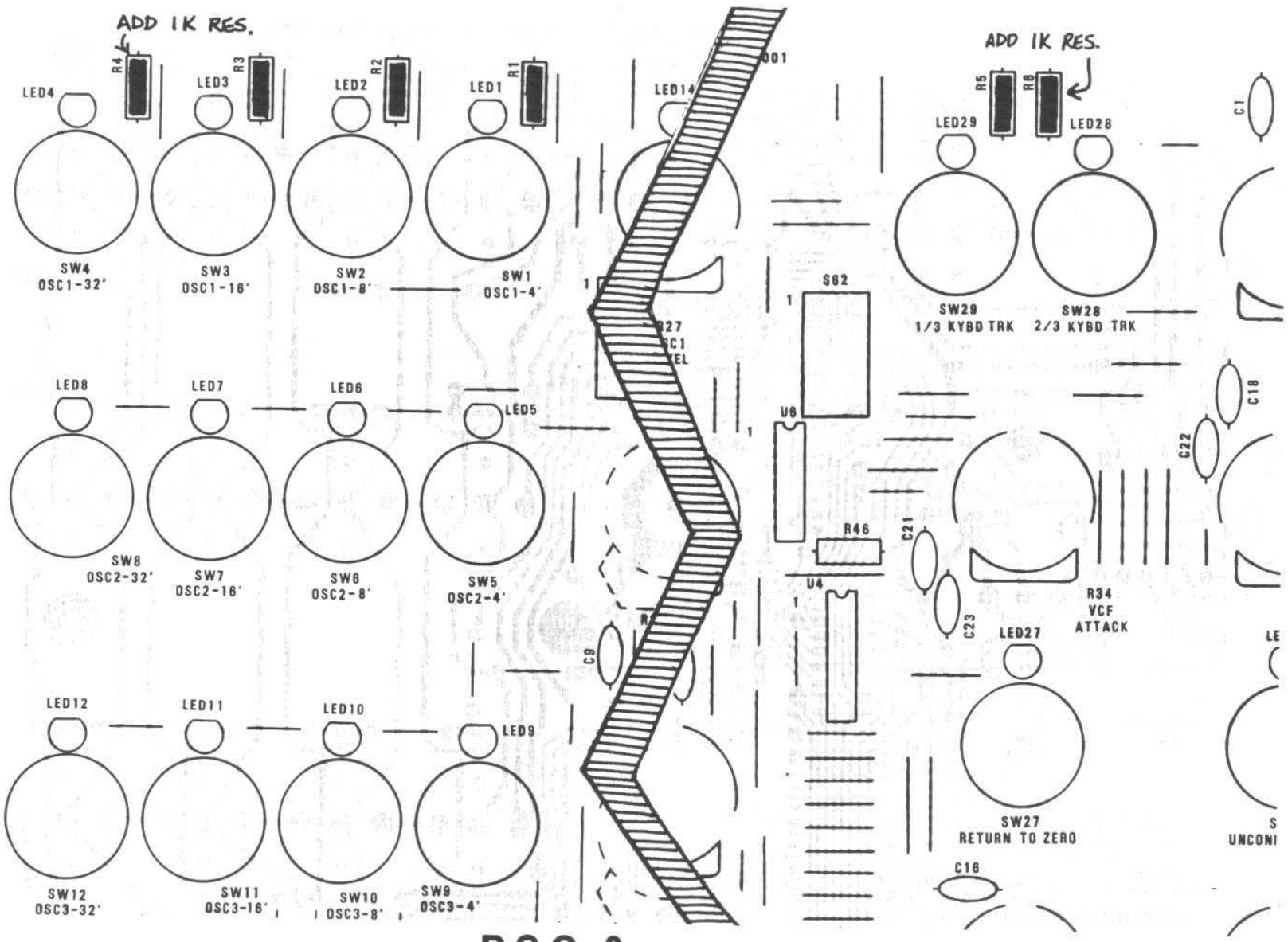
Solder the contact by applying solder around the outside ring. DO NOT FILL the central stem portion of the contact or flux will be deposited on the contact surfaces.

Check each switch and LED for proper operation BEFORE remounting the control boards.

LABOR: This modification is estimated to take 45 minutes and will be reimbursed by Moog at a FLAT RATE of $20.00. When required, this modification is covered under warranty regardless of the warranty expiration date to the original owner.

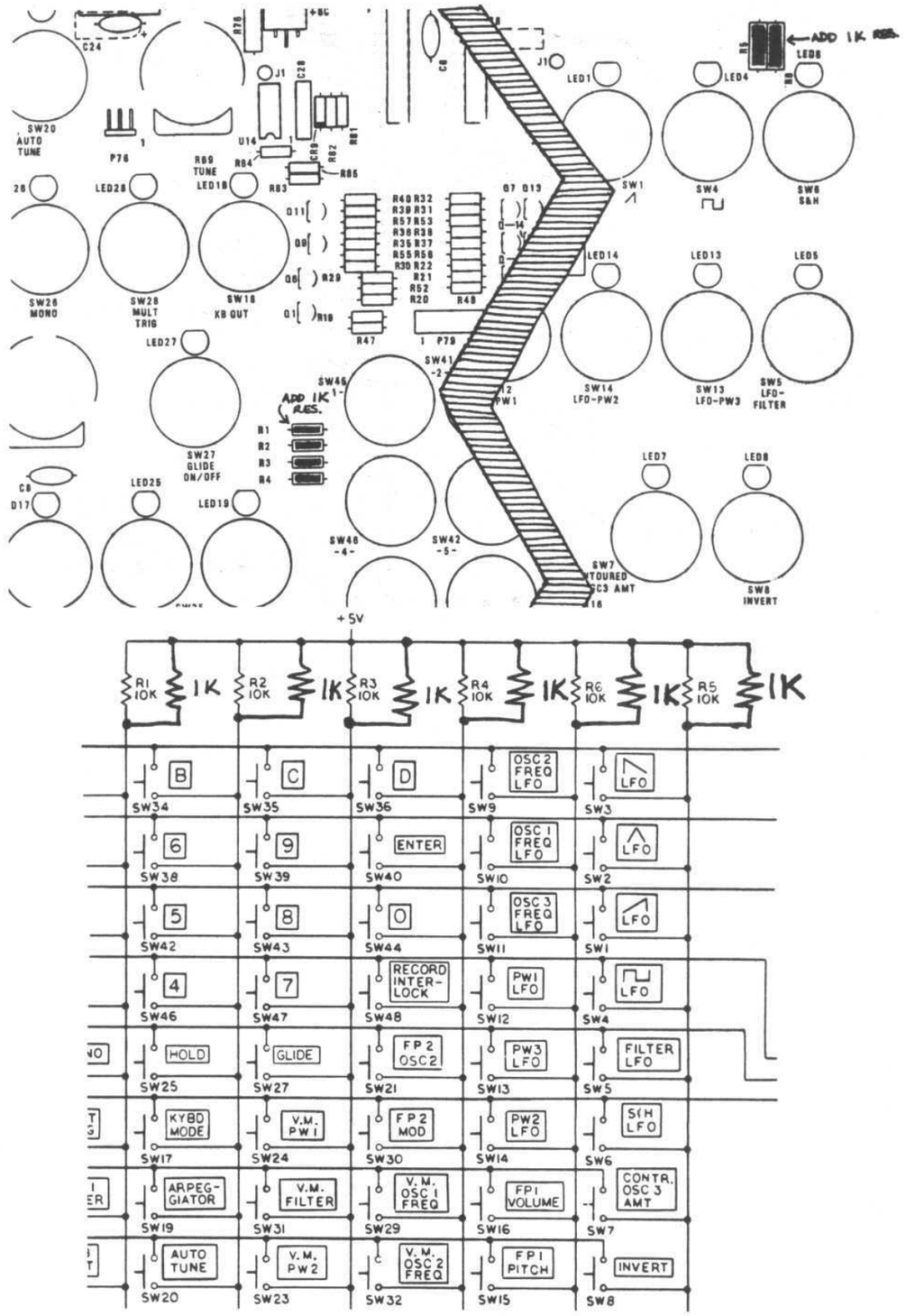

C24
R78
+6C
J1
C28
C6
J1
LED1
R5
ADD 1K RES.
LED4
R6
LED6
R77
SW20
AUTO
TUNE
P76
1
U14
1
CR9
R82
R81
R69
TUNE
R84
R85
R83
LED26
LED28
LED18
SW1
SW4
SW6
S&H
Q11
Q9
Q8
Q1
R29
R19
R40 R32
R39 R31
R57 R53
R36 R38
R35 R37
R55 R56
R30 R22
R21
R52
R20
R48
R47
1 P79
Q7 Q13
Q14
LED14
LED13
LED5
SW26
MONO
SW28
MULT
TRIG
SW18
KB OUT
SW41
-2-
SW45
1-
SW14
LFO-PW2
SW13
LFO-PW3
SW5
LFO-
FILTER
LED27
ADD 1K
RES.
R1
R2
R3
R4
R61
GLIDE
AMT
SW27
GLIDE
ON/OFF
C8
LED17
LED25
LED19
LED7
LED8
SW46
-4-
SW42
-5-
SW7
TOURED
SC3 AMT
SW8
INVERT
SW17
KB MODE
SW25
HOLD
SW19
ARPEGGIATOR
SW47
-7-
R74
16
R17
R16
R18
R8
R7
R9
Q18
Q15
Q17
SW43
-8-
+6A BYPASS

L.S.C.

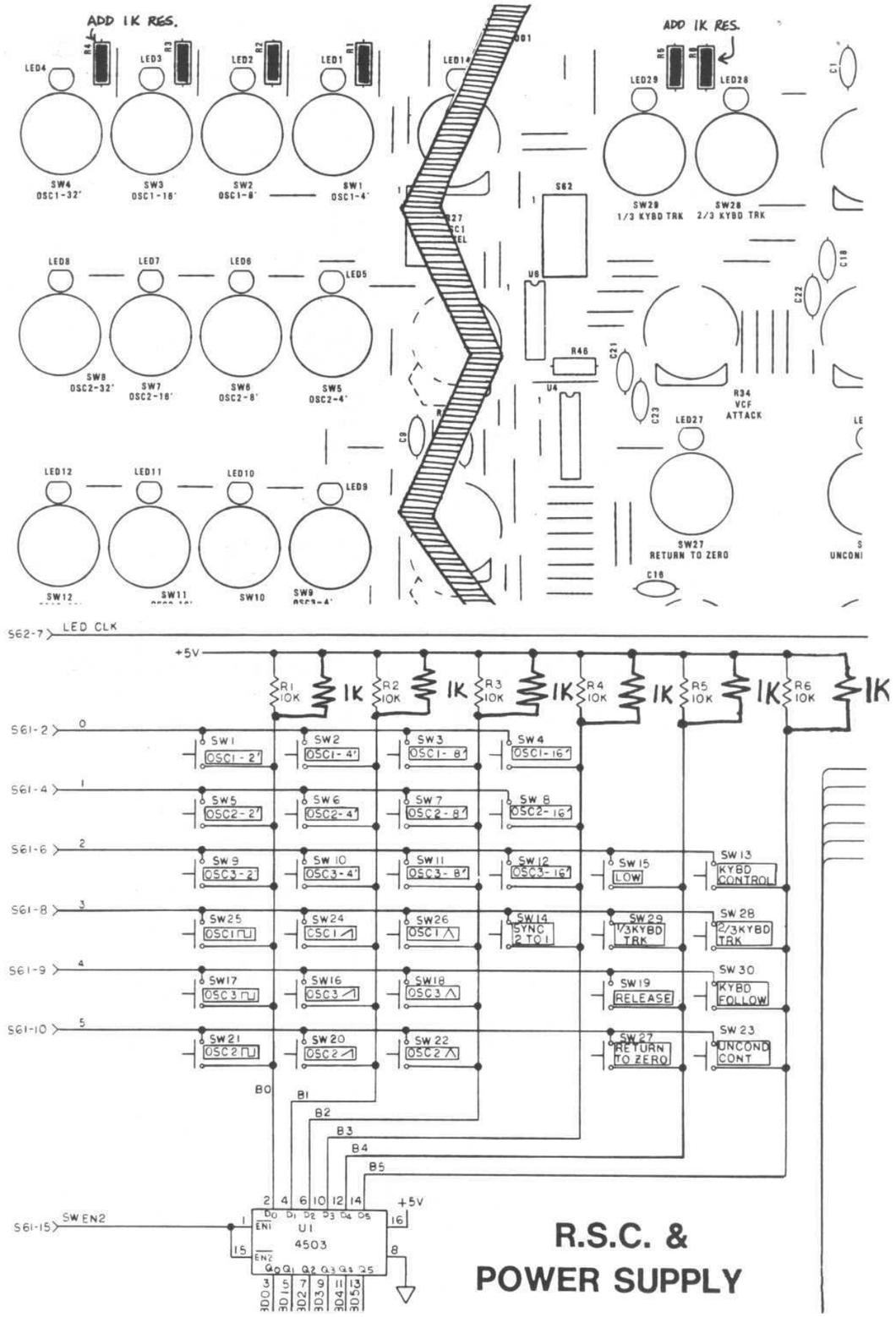


R.S.C. &

POWER SUPPLY


ADD 1K RES.
SW20 AUTO TUNE
P76
R89 TUNE
LED28
LED18
SW26 MONO
SW28 MULT TRIG
SW18 KB OUT
R47
P79
LED27
SW27 GLIDE ON/OFF
ADD 1K RES.
LED25
LED19
SW46
SW41
SW42
SW1
SW4
SW6 S&H
LED14
LED13
LED5
SW12 PW1
SW14 LFO-PW2
SW13 LFO-PW3
SW5 LFO-FILTER
LED7
LED8
SW7 MODULATION OSC3 AMT
SW8 INVERT
+5V
R1 10K
R2 10K
R3 10K
R4 10K
R6 10K
R5 10K
1K
B
SW34
C
SW35
D
SW36
OSC2 FREQ LFO
SW9
LFO
SW3
6
SW38
9
SW39
ENTER
SW40
OSC1 FREQ LFO
SW10
LFO
SW2
5
SW42
8
SW43
0
SW44
OSC3 FREQ LFO
SW11
LFO
SW1
4
SW46
7
SW47
RECORD INTER-LOCK
SW48
PW1 LFO
SW12
LFO
SW4
HOLD
SW25
GLIDE
SW27
FP2 OSC2
SW21
PW3 LFO
SW13
FILTER LFO
SW5
KYBD MODE
SW17
V.M. PW1
SW24
FP2 MOD
SW30
PW2 LFO
SW14
S/H LFO
SW6
ARPEG-GIATOR
SW19
V.M. FILTER
SW31
V.M. OSC1 FREQ
SW29
FP1 VOLUME
SW16
CONTR. OSC3 AMT
SW7
AUTO TUNE
SW20
V.M. PW2
SW23
V.M. OSC2 FREQ
SW32
FP1 PITCH
SW15
INVERT
SW8

L.S.C.


ADD 1K RES.
ADD 1K RES.
LED4
LED3
LED2
LED1
LED14
LED29
LED28
SW4 OSC1-32'
SW3 OSC1-16'
SW2 OSC1-8'
SW1 OSC1-4'
SW29 1/3 KYBD TRK
SW28 2/3 KYBD TRK
LED8
LED7
LED6
LED5
SW8 OSC2-32'
SW7 OSC2-16'
SW6 OSC2-8'
SW5 OSC2-4'
R34 VCF ATTACK
LED27
LED12
LED11
LED10
LED9
SW27 RETURN TO ZERO
SW12
SW11
SW10
SW9
S62-7 LED CLK
+5V
R1 10K
R2 10K
R3 10K
R4 10K
R5 10K
R6 10K
1K
S61-2
S61-4
S61-6
S61-8
S61-9
S61-10
S61-15
SW1 OSC1-2'
SW2 OSC1-4'
SW3 OSC1-8'
SW4 OSC1-16'
SW5 OSC2-2'
SW6 OSC2-4'
SW7 OSC2-8'
SW8 OSC2-16'
SW9 OSC3-2'
SW10 OSC3-4'
SW11 OSC3-8'
SW12 OSC3-16'
SW15 LOW
SW13 KYBD CONTROL
SW25 OSC1
SW24 OSC1
SW26 OSC1
SW14 SYNC 2 TO 1
SW29 1/3 KYBD TRK
SW28 2/3 KYBD TRK
SW17 OSC3
SW16 OSC3
SW18 OSC3
SW19 RELEASE
SW30 KYBD FOLLOW
SW21 OSC2
SW20 OSC2
SW22 OSC2
SW27 RETURN TO ZERO
SW23 UNCOND CONT
B0
B1
B2
B3
B4
B5
SW EN2
U1
4503
R.S.C. &
POWER SUPPLY

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOG AUTOTUNE UPDATE BULLETIN: 840 DATE: 10/6/83
Serial numbers below 2723
Software Revision 2.4 (C, 0, ENTER displays 83)
Kit Part Number 997-044667-101

NOTE: This is a non-warranty update. Customers with serial numbers below 1212 AND 1.4 or 1.5 software may elect to apply a one-time no-charge software update by receiving the Autotune kit under warranty. However, labor is NOT covered.

This update improves the AUTOTUNE range, consistency and accuracy. It will adjust tuning for plus or minus two semitones, compensate for each note on the keyboard (true scale correction) and tune each oscillator with a reiterative feedback loop. The AUTOTUNE program takes approximately sixteen seconds versus older ten second versions. This update is a prerequisite for inclusion in the SEQUENCER/MIDI modification. The AUTOTUNE update is estimated to take three to four hours.

NOTE: Bulletins 834, 837 and 838 MUST be installed prior to this update for the best possible tuning stability.

The modification has eight main sections, however, before proceeding with these changes, it is strongly suggested that ANY NECESSARY REPAIRS ARE COMPLETED FIRST (excluding tuning) so that any troubleshooting is not unduly complicated by what follows here:

MODIFICATION SUMMARY

1) CASSETTE - SAVE and VERIFY customer presets.
2) DMUX BOARD - change 18 resistors, 13 capacitors and add a jumper.
3) DIGITAL BOARD - change EPROMS and add a resistor.
4) COMMON ANALOG BOARD - add two jumpers and a small buffer board.
5) HARNESS - reroute one wire.
6) CASSETTE - LOAD customer presets.
7) TUNING - rerange each oscillator and, in some cases, adjust the master oscillator summers.
8) SCHEMATICS - update layout and circuit information.

CASSETTE - OWNER'S PRESETS

The Memorymoog AUTOTUNE update increases the AUTOTUNE range to "16 bits" of resolution. This causes the presets and SECURITY CODE to change unpredictably, therefore, it is necessary to SAVE the existing presets on a cassette tape (C,1,ENTER), and VERIFY the cassette (C,3,ENTER), with the "original" EPROMs as your first procedure.

DMUX MODIFICATIONS - BOARD #5

Referring to the disassembly procedure on page 131 of the service manual, remove the eight (8) DMUX board mounting screws, the nine (9) base retaining screws and three (3) back panel screws.

Once the Memorymoog is open, remove the four (4) front screws on the DIGITAL/COMMON ANALOG boards and the four (4) front screws on the VOICE CARD stacks to allow the boards to hinge back.

Referring to the enclosed diagrams, disconnect the following connectors from the DMUX board: S54, S58, S59, (3) P-512 and P-519. Then disconnect VOICE CARD connectors S-11 and P17 and lastly, disconnect the keyboard connector P-121.

Once the screws and connectors are removed from the DMUX/DIGITAL/COMMON ANALOG stack, rotate the entire assembly forward (toward the front panel) so the underside of the DMUX board faces outward.

Using a high power 75 watt soldering iron, unsolder, remove and replace the capacitors below. If a high power iron is not available, a variac set at 140 volts in conjunction with a standard 45 watt iron will provide the necessary power to heat these large pads.

moog Synthesizers · Gibson Amplifiers · MAESTRO Sound Modifiers · Cordovox Accordions · Epiphone Amplifiers · LABSERIES Amplifiers · SG Amp

REPLACE THESE CAPACITORS WITH 75 WATT SOLDERING IRON
C45, C46, C41, C40, C39, C51, C52, C49
C48, C47, C50, C20, C18 (13 capacitors mounted left to right and top to bottom).

Replace with .047uf capacitors, part # 946-041978-473.

Then, using a standard 45 watt iron without a variac, unsolder, remove and replace the 115K resistors noted below, perform the jumper modification and proceed with the remainder of the update.

REPLACE EVEN NUMBER RESISTORS FROM R84 THROUGH R118 WITH 45 WATT SOLDERING IRON.
R86, R84, R98, R96, R100, R92, R90, R88, R94, R102, R114, R118, R104, R112, R108, R110, & R116 (18 resistors as mounted from left to right).

Replace with 17.4K 1% resistors, part number R106, 853-421742-031

R105

Add a 1.5" (38mm) insulated jumper from S-55 pin 2 to U54 pin 2 on the BOTTOM of the board (part number 996-045655-962).

CAUTION: These are in very critical portions of the DMUX board where LEAKAGE DUE TO FLUX WILL DEGRADE THE PERFORMANCE of the pitch port sample and hold circuits. Be sure to clean all flux residue thoroughly after soldering, using isopropyl alcohol or flux remover, a brush and an absorbant tissue to "catch" the fluid - so it does not spread any further than necessary on the board surface.

This completes the DMUX board modifications. Rotate the boards back into normal position and replace the connectors. Resecure the boards later after additional modifications are made to the DIGITAL and COMMON ANALOG BOARDS.

DIGITAL BOARD MODIFICATIONS - BOARD #4
Referring to the enclosed diagram and schematic excerpts, the DIGITAL board requires a trace cut between U26 pin 10 and P47 pin 2. Across this same trace cut, a 33k resistor is to be tack-soldered on the BOTTOM side of the board.

EPROMs U2, U3 and U4 are to be exchanged with versions 2.2 and the old versions returned to Moog in the velostat foam and antistatic bag and shipping carton provided.

33K 5% carbon film resistor	Part # 852-312333-001
EPROM U2 #1 Version 2.4	Part # 993-045944-124
EPROM U3 #2 Version 2.4	Part # 993-045944-224
EPROM U4 #3 Version 2.4	Part # 993-045944-324

COMMON ANALOG BOARD MODIFICATIONS - BOARD #2
Reroute the wiring around U4A as follows on the TOP side of the board:
1) Cut the rear end of resistor R31, the end nearest R17.
2) Tack-solder the free end of R31 to the end of a 3" (70mm) insulated jumper wire (1/2 of part number 996-045646-962).
3) Tack-solder the other end of the 3" (70mm) jumper to the FRONT side of R75 as shown.

On the schematic, this changes the connection of R31 from its present location at Pin 2 to its new location at Pin 1 of U4A.

Next, change the routing of P24-2 connector on the BOTTOM of the board by tack-soldering a 2.5" (63mm) insulated jumper between P24-2 and S21-2 (1/2 of part number 996-045646-962).

CAUTION: This is a very critical portion of the COMMON ANALOG BOARD where FLUX LEAKAGE WILL DEGRADE PERFORMANCE. Be sure to clean flux residue thoroughly as above.

BUFFER BOARD
Follow the attached installation diagrams.

HARNESS MODIFICATION
Cut the blue wire on the COMMON ANALOG board at the MTA connector P24 Pin 2 and place it into the MTA connector P47 Pin 2 on the DIGITAL board using an AMP tool, small flat blade screwdriver, or pair of small needle-nose pliers.

CASSETTE - LOAD

Due to the software change in the RAM "MEMORY MAP", the RAMS on the DIGITAL BOARD must be re-initialized by momentarily shorting out C13 on the DIGITAL BOARD with the AC power off. C13 is located immediately to the left of the battery. This will force the SECURITY CODE back to "0 0 0 0 DISABLED". Turn the power ON and hit: C,8 ENTER, 0 0 0 0, ENTER. This will "ENABLE" the memory. LOAD back the tape from above by hitting C2 ENTER. Notify the customer that the SECURITY CODE is now back to the original 0 0 0 0 and is ENABLED.

VOICE CARD TUNING

After performing this modification, the C7 software tuning parameters will be sharp from the A's to "PITCH HI". Therefore, simply "RANGE" down all 18 oscillators to the nominal 7F value using the C7 routine. Complete recalibration will NOT be necessary.

COMMON ANALOG TUNING

Between the approximate serial numbers 1600 and 2632 it will be necessary to readjust the OSCILLATOR OFFSET, SUM and OCTAVE trims. Refer to page 149 of the service manual for the proper procedure.

SCHEMATIC UPDATE

Make the above changes in your schematics and the customer's schematics. This completes the modification.

Pg. 23-26 - KEYBOARD, MONO & ARPEGGIATOR MODES

The displaying of keyboard and arpeggiator modes has been changed tomake them easier to read and remember. The functions of the various modes, however, have not been changed. The previous modes referred to in the manual and the corresponding new modes are listed below:

KEYBOARD MODES

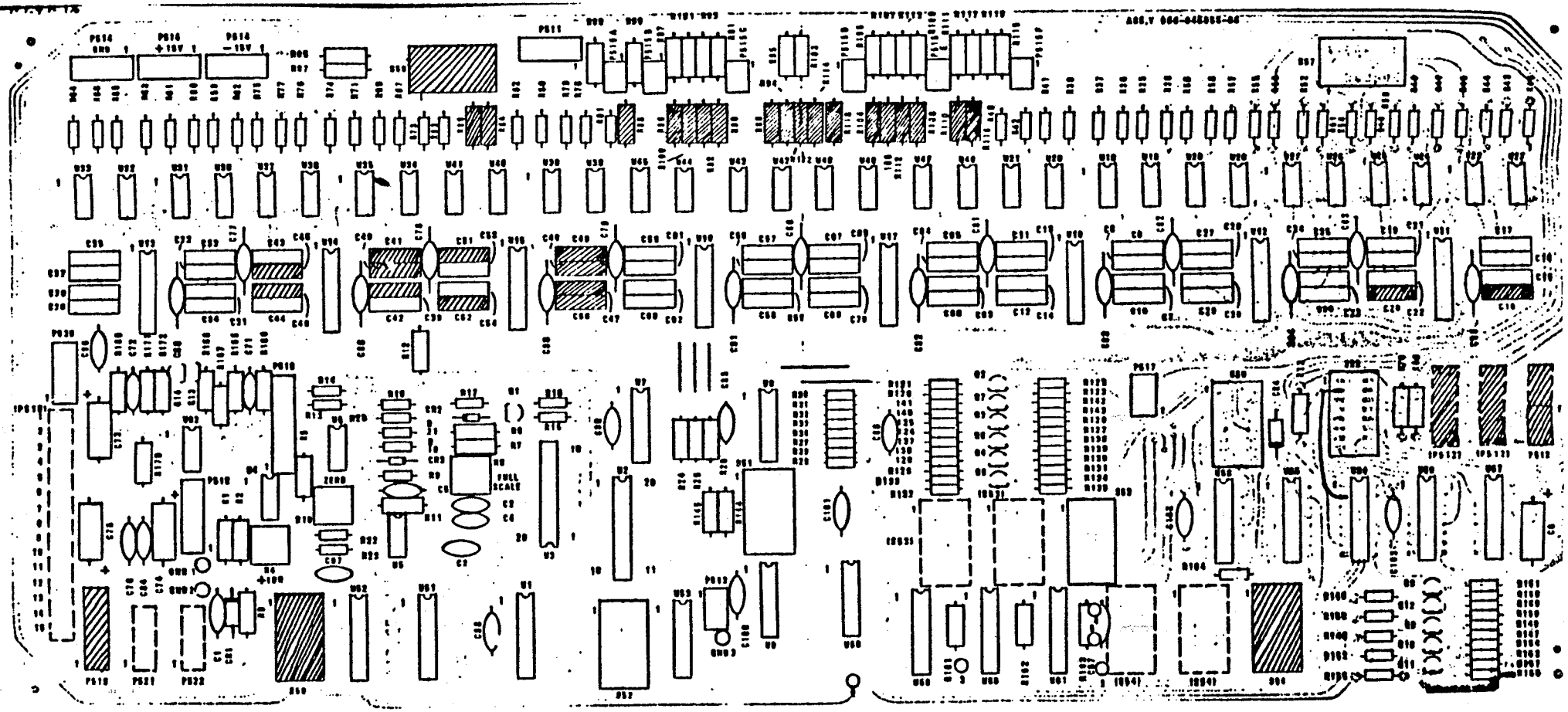
POLY 1	CYLIC
POLY 2	MEM CYC
POLY 3	RESET
POLY 4	MEM RES

ARPEGGIATOR MODES

MODE 1	UP U
MODE 2	DWN U
MODE 3	UP DWN U
MODE 4	UP L
MODE 5	DWN L
MODE 6	UP DWN L
MODE 7	AUTOTRIG
MODE 8	1 LAST U
MODE 9	1 LAST L

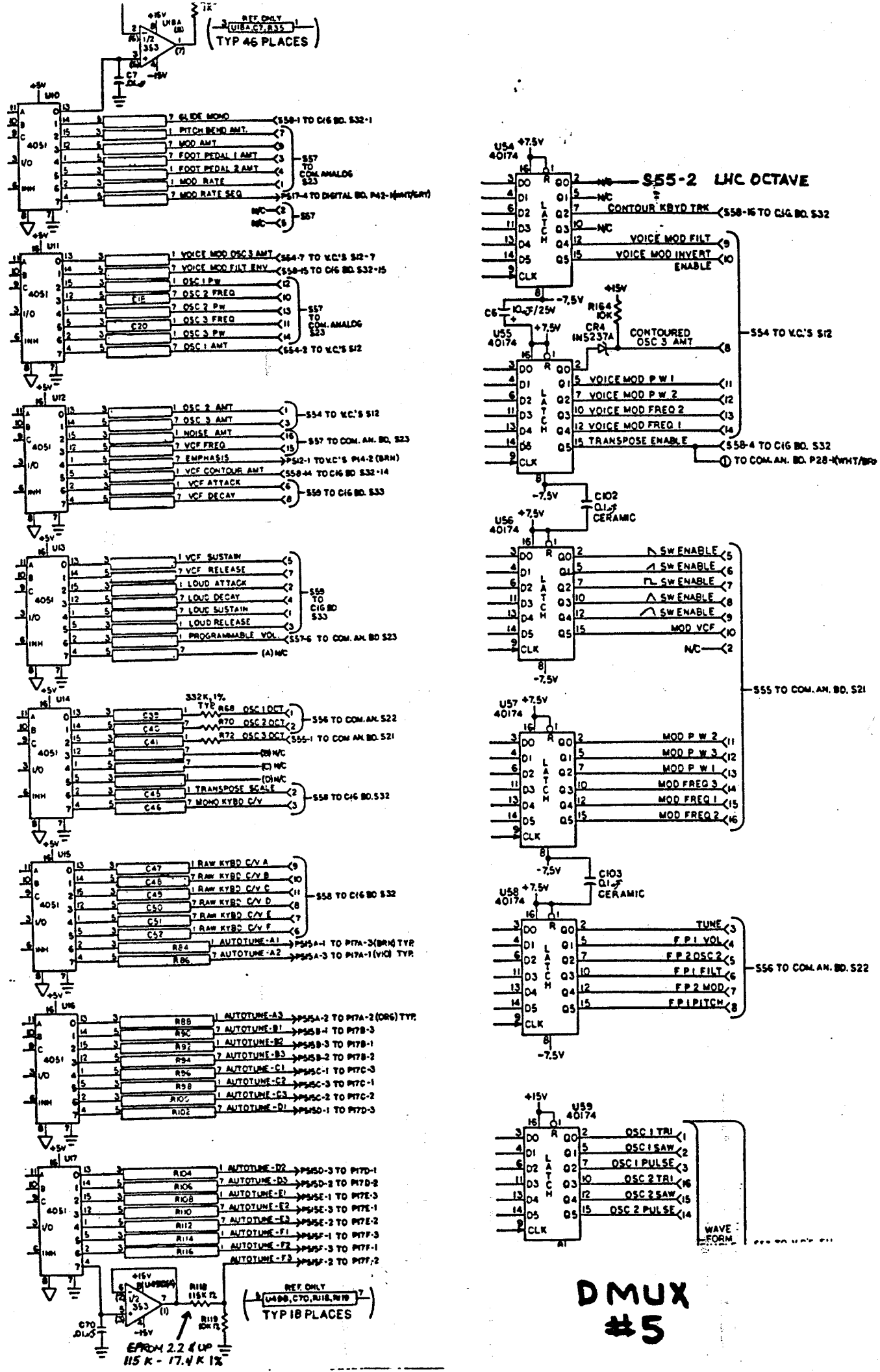
MONO MODES

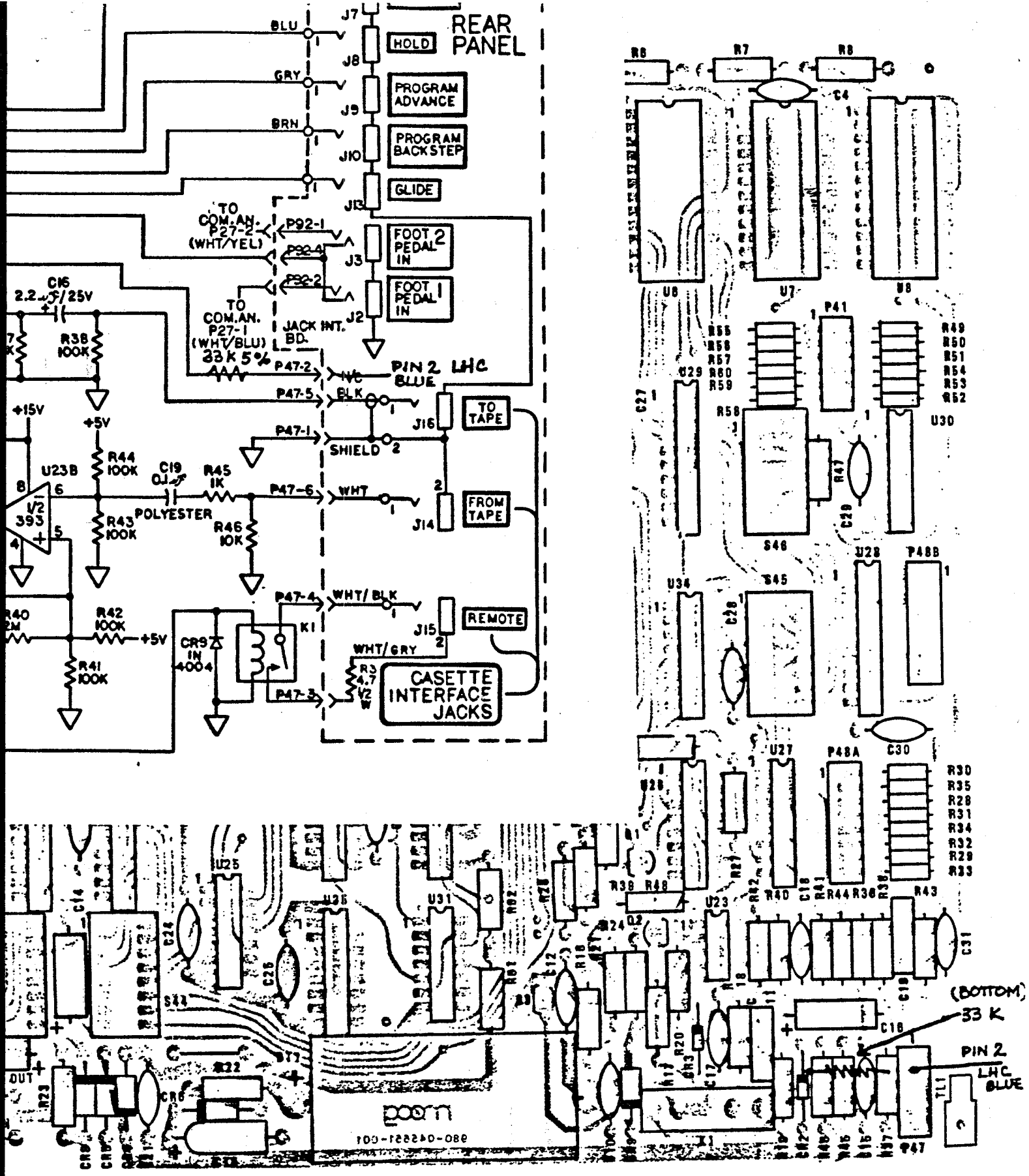
MONO 1	LATEST
MONO 2	LOW
MONO 3	HIGH



DMUX PRINTED CIRCUIT BOARD (BOARD NO. 5)

DMUX
#5

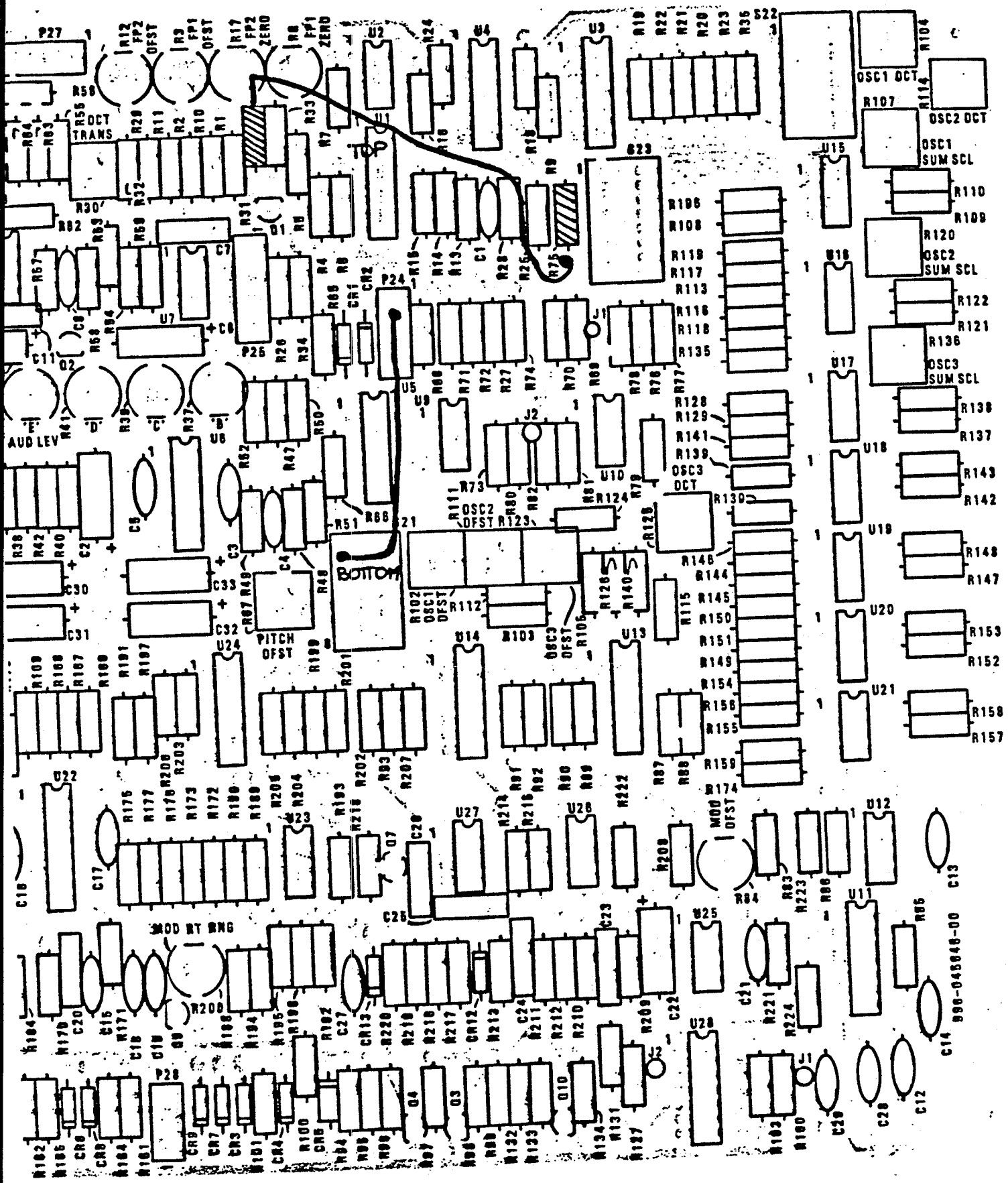

TYP 46 PLACES
REF ONLY (U18A, C7, R35)
U10
4051
GLIDE MONO
PITCH BEND AMT.
MOD AMT
FOOT PEDAL 1 AMT
FOOT PEDAL 2 AMT
MOD RATE
MOD RATE SEQ
S57 TO COM. ANALOG S23
U11
VOICE MOD OSC 3 AMT
VOICE MOD FILT ENV
OSC 1 PW
OSC 2 FREQ
OSC 2 PW
OSC 3 FREQ
OSC 3 PW
OSC 1 AMT
U12
OSC 2 AMT
OSC 3 AMT
NOISE AMT
VCF FREQ
EMPHASIS
VCF CONTOUR AMT
VCF ATTACK
VCF DECAY
S59 TO C16 BD. S33
U13
VCF SUSTAIN
VCF RELEASE
LOUD ATTACK
LOUD DECAY
LOUD SUSTAIN
LOUD RELEASE
PROGRAMMABLE VOL
U14
332K, 1% TYP
R68 OSC 1 OCT
R70 OSC 2 OCT
R72 OSC 3 OCT
TRANSPOSE SCALE
MONO KYBD C/V
S58 TO C16 BD. S32
U15
RAW KYBD C/V A
RAW KYBD C/V B
RAW KYBD C/V C
RAW KYBD C/V D
RAW KYBD C/V E
RAW KYBD C/V F
AUTOTUNE-A1
AUTOTUNE-A2
U16
AUTOTUNE-A3
AUTOTUNE-B1
AUTOTUNE-B2
AUTOTUNE-B3
AUTOTUNE-C1
AUTOTUNE-C2
AUTOTUNE-C3
AUTOTUNE-D1
U17
AUTOTUNE-D2
AUTOTUNE-D3
AUTOTUNE-E1
AUTOTUNE-E2
AUTOTUNE-E3
AUTOTUNE-F1
AUTOTUNE-F2
AUTOTUNE-F3
R118 115K 1%
R119 EOM 1%
EPROM 2.2 & UP
115 K - 17.4 K 1%
REF ONLY (U18B, C70, R118, R119)
TYP 18 PLACES
U54 40174
S55-2 LHC OCTAVE
CONTOUR KBYD TRK
VOICE MOD FILT
VOICE MOD INVERT ENABLE
U55 40174
CONTOURED OSC 3 AMT
S54 TO V.C.'S S12
VOICE MOD P W 1
VOICE MOD P W 2
VOICE MOD FREQ 2
VOICE MOD FREQ 1
TRANSPOSE ENABLE
C102 0.1 CERAMIC
U56 40174
SW ENABLE
MOD VCF
S55 TO COM. AN. BD. S21
U57 40174
MOD P W 2
MOD P W 3
MOD P W 1
MOD FREQ 3
MOD FREQ 1
MOD FREQ 2
C103 0.1 CERAMIC
U58 40174
TUNE
F P 1 VOL
F P 2 OSC 2
F P 1 FILT
F P 2 MOD
F P 1 PITCH
S56 TO COM. AN. BD. S22
U59 40174
OSC 1 TRI
OSC 1 SAW
OSC 1 PULSE
OSC 2 TRI
OSC 2 SAW
OSC 2 PULSE
WAVE FORM
DMUX #5



DIGITAL PRINTED CIRCUIT BOARD (BOARD NO. 4)

REVISED 3/83

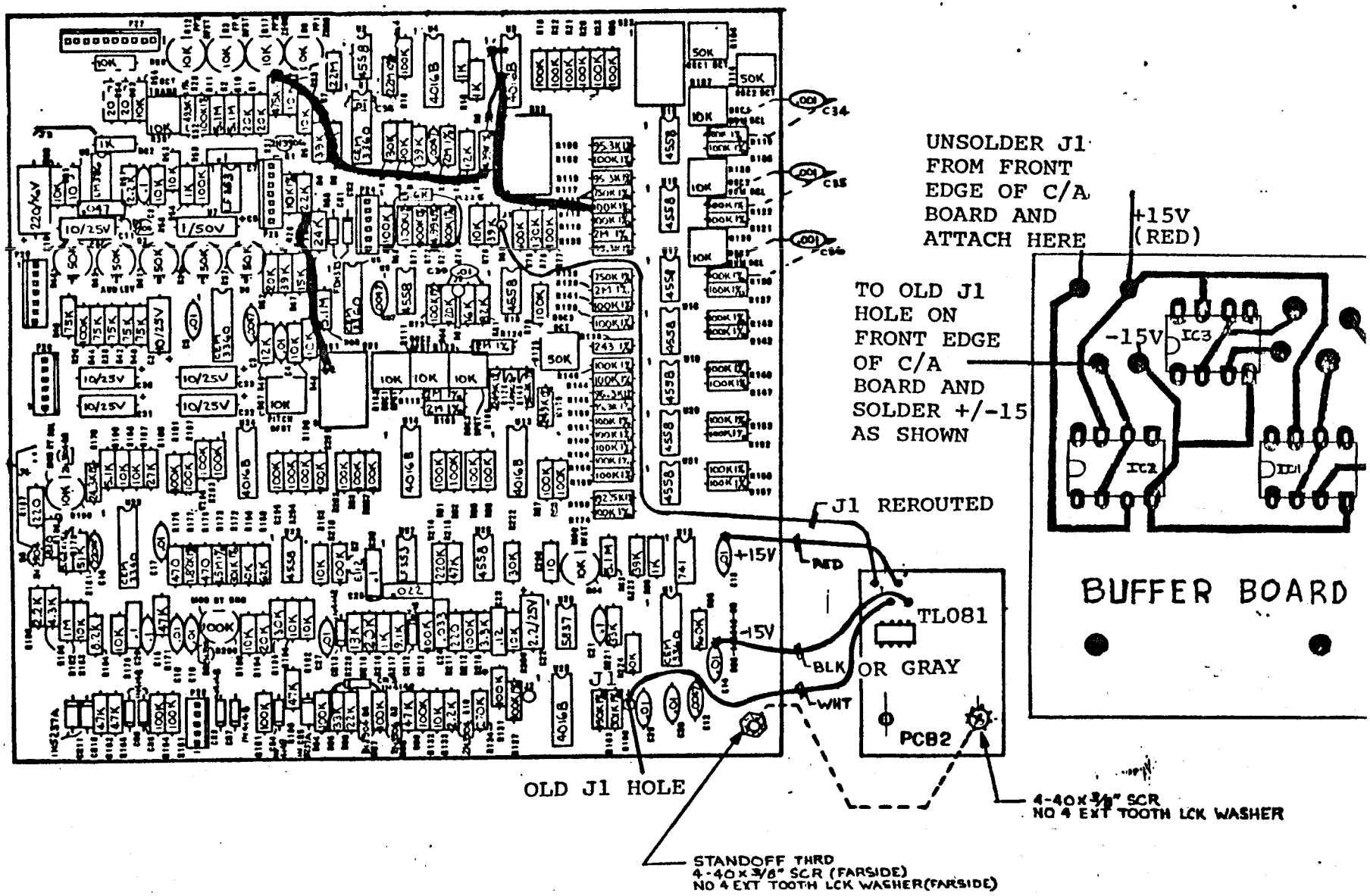
DIGITAL MEMORYMOOG 4



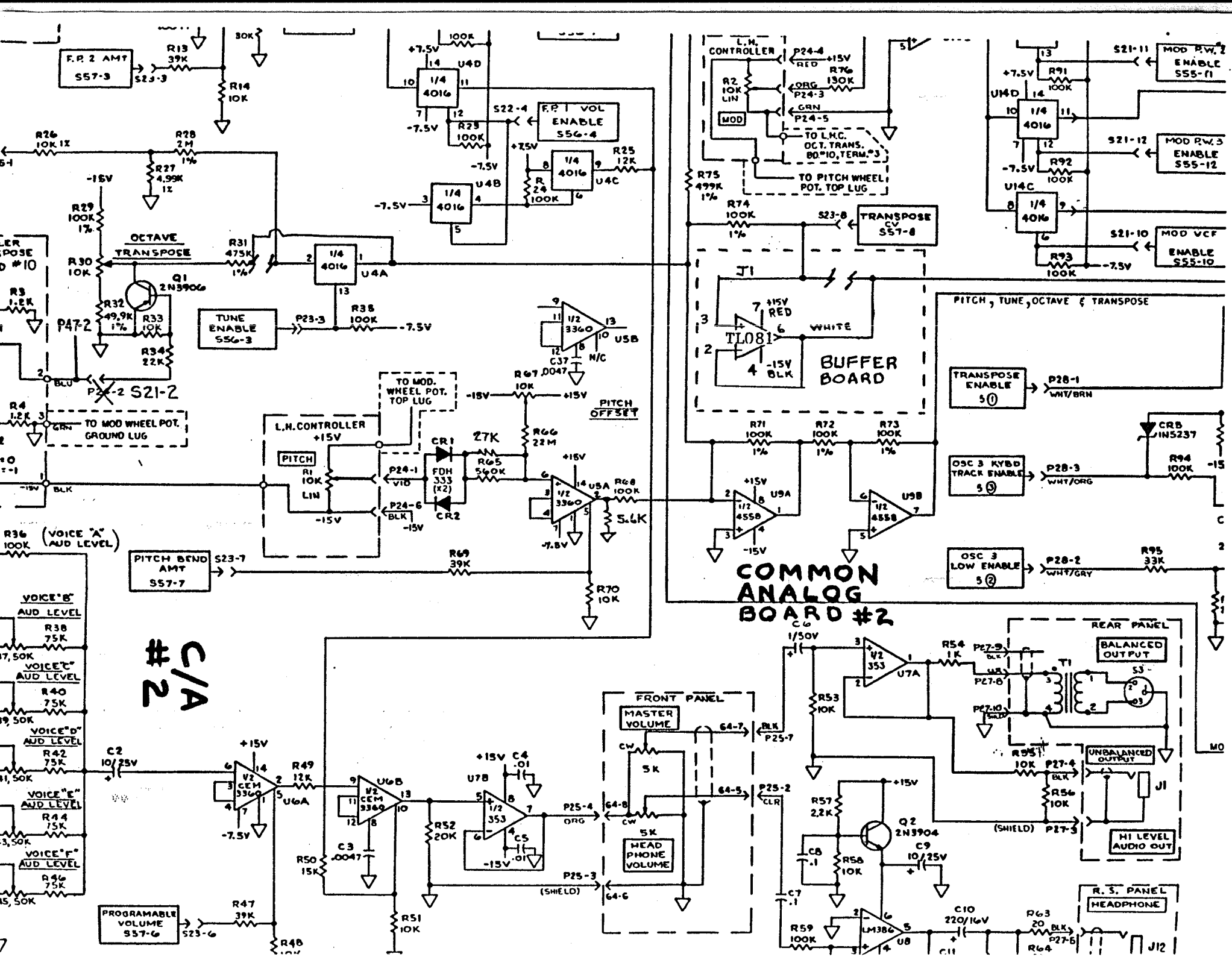
MON ANALOG PRINTED CIRCUIT BOARD (BOARD NO. 2)

COMMON ANALOG MEMORYMOOG 2

REVISED 3/83



COMMON ANALOG #2


COMMON ANALOG BOARD #2
C/A #2
F.P. 2 AMT S57-3
S23-3
R13 39K
R14 10K
30K
R26 10K 1%
R28 2M 1%
R27 4.99K 1%
-15V
R29 100K 1%
OCTAVE TRANSPOSE
R30 10K
R31 475K 1%
Q1 2N3906
R32 49.9K 1%
R33 10K
R34 22K
P47-2
P23-2 S21-2
TUNE ENABLE S56-3
P23-3
R38 100K
-7.5V
R3 1.2K
R4 1.2K
TO MOD WHEEL POT. GROUND LUG
TO MOD. WHEEL POT. TOP LUG
L.H. CONTROLLER +15V
PITCH
R1 10K LIN
-15V
P24-1 VIO
P24-6 BLK
CR1
CR2
FDH 333 (X2)
27K
R65 560K
R66 22M
R67 .0047
-15V
+15V
PITCH OFFSET
U5A
R68 100K
5.6K
-7.8V
R36 100K (VOICE "A" AUD LEVEL)
PITCH BEND AMT S57-7
S23-7
R69 39K
R70 10K
VOICE "B" AUD LEVEL
R38 75K
VOICE "C" AUD LEVEL
R40 75K
VOICE "D" AUD LEVEL
R42 75K
VOICE "E" AUD LEVEL
R44 75K
VOICE "F" AUD LEVEL
R46 75K
C2 10/25V
U6A
R49 12K
U6B
R50 15K
C3 .0047
R52 20K
R51 10K
U7B
C4 .01
C5 .01
PROGRAMABLE VOLUME S57-6
S23-6
R47 39K
R48
P25-4 ORG
P25-3 (SHIELD)
FRONT PANEL
MASTER VOLUME
5K
HEAD PHONE VOLUME
64-7
64-8
64-6
64-5
P25-7 BLK
P25-2 CLR
L.H. CONTROLLER
R2 10K LIN
MOD
P24-4 RED +15V
P24-3 ORG
P24-5 GRN
R76 130K
TO L.H.C. OCT. TRANS. 80*10, TERM.*3
TO PITCH WHEEL POT. TOP LUG
R75 499K 1%
R74 100K 1%
S23-8
TRANSPOSE CV S57-8
J1
BUFFER BOARD
TL081
WHITE
RED
BLK
PITCH, TUNE, OCTAVE & TRANSPOSE
R71 100K 1%
R72 100K 1%
R73 100K 1%
U9A
U9B
TRANSPOSE ENABLE 5①
P28-1 WHT/BRN
OSC 3 KYBD TRACK ENABLE 5③
P28-3 WHT/ORG
OSC 3 LOW ENABLE 5②
P28-2 WHT/GRY
CR8 IN5237
R94 100K
R95 33K
S21-11
MOD P.W.2 ENABLE S55-11
S21-12
MOD P.W.3 ENABLE S55-12
S21-10
MOD VCF ENABLE S55-10
R91 100K
R92 100K
R93 100K
REAR PANEL
BALANCED OUTPUT
T1
S3
P27-9 BLK
P27-8 WHT
P27-10 SHLD
R54 1K
U7A
R53 10K
C6 1/50V
R55 10K
P27-4 BLK
UNBALANCED OUTPUT
J1
R56 10K
P27-3 (SHIELD)
HI LEVEL AUDIO OUT
R57 2.2K
Q2 2N3904
C8 .1
R58 10K
C9 10/25V
C7 .1
R59 100K
U8 LM386
C10 220/16V
C11
R63 20 BLK
R64
P27-5
R.S. PANEL HEADPHONE
J12

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

MEMORYMOOG SEQUENCER/MIDI UPDATE BULLETIN 841A

REVISION DATE: January 6, 1983
SERIAL NUMBERS BELOW 3000
REVISION 4.0up (C,0,ENTER displays 84)
LABOR ESTIMATE: 2 hours
KIT PART NUMBER 997-046090-901

This is a customer option non-warranty update requiring the AUTOTUNE kit as a prerequisite. If the AUTOTUNE kit is being added at the same time, it should be fully tested with its own EPROMs before proceeding with the Sequencer installation. Additionally, the following bulletins are necessary for the best possible stability and reliability: 834, 835, 837 and 838. Before attempting this modification, it is strongly suggested that ANY NECESSARY REPAIRS BE COMPLETED FIRST so that troubleshooting is not complicated by the sequencer update.

MODIFICATION SUMMARY

1) SAVE & VERIFY CUSTOMER PRESETS
2) POWER SUPPLY UPDATE
3) ADD COMPONENTS & NEW BUTTONS TO LSC
4) UPDATE DIGITAL BOARD
5) UPDATE COMMON ANALOG RESISTORS
6) INSTALL SEQUENCER/MIDI BOARD
7) UPDATE HARNESS
8) INSTALL NAMEPLATE AND OVERLAY
9) LOAD CUSTOMER PRESETS
10) TEST AND REASSEMBLE
11) UPDATE CUSTOMER DOCUMENTATION
12) MAIL IN OLD EPROMS

OWNER PRESETS

With the "original" EPROMS installed, SAVE (C,1,ENTER) and VERIFY (C,3,ENTER) the customer's existing presets as your very first step. Ask the customer if he wants his current presets reloaded or the Moog factory presets when the update is completed. Also ask that the Memorymoog Owner/Service manual be left with you for updating. Ask the customer for his four digit code so that the Memorymoog can be "ENABLED". Unless customer gives you the security code to be loaded into unit, the code will be reset to 0000 to ENABLE programs to be saved.

POWER SUPPLY BOARD #13

Remove power supply according to the procedure described in service bulletin 838. Perform modifications contained in the bulletin using parts supplied.DO NOT REINSTALL power supply until LSC board modifications are completed.

LEFT SIDE CONTROL BOARD #7

Disassemble the Left Side Contol Board according to the Service Manual Procedure described on page 131. Change R79 from a 220 ohm to the 100 ohm resistor provided. For units with a descrete Power Clear Board, the 220 ohm resistor R79 is located on the solder side of the board and is attached directly to the LFO RATE LED. Also change C28 in the display clear circuitry from a .0047uf to a .01uf capacitor.

NOTE: Be sure all return springs are removed according to Bulletin 839 before proceding further.

Remove the following WAVEFORM switch buttons in the LFO MODULATION section and replace them with the blank lighter color versions supplied: TRIANGLE, SAWTOOTH, REVERSE SAWTOOTH, SQUAREWAVE, SAMPLE/HOLD and FILTER. Then remove the DESTINATION switch buttons FREQ 1, FREQ 2, FREQ 3, PW 1, PW 2 and PW 3 and replace these with the lighter color versions labeled 1 through 6 respectively.

moog Synthesizers · Gibson Amplifiers · MAESTRO Sound Modifiers · cordovox Accordions · Epiphone Amplifiers · LABSERIES Amplifiers · SG Amps.

CAUTION: To avoid damaging LED's, remove the switch buttons by pushing them UP using a screwdriver handle from underneath. To reinsert the new plastic buttons, apply firm even downward pressure, being careful not to push too hard causing damage to the contact from an excessive "release" action.

(NOTE: To perform the following check, power supply must be temporarily reconnected to the heat sink.)
Check each switch and LED for proper operation first, then reassemble the Left Side Control Board into its normal position following the procedure outlined in the Service Manual.

If switches do not function properly, refer to bulletin 839. If the left side control board switches function properly, reinstall the power supply.

DIGITAL BOARD #4
Hinge open the Digital Board and Common Analog Board combination. Following the diagrams provided, cut the four traces and add the three jumper wires as shown. Install a 10K resistor and 1N4148 diode/jumper as shown. (The 33K resistor noted is from the earlier Autotune modification requirements). BE SURE THAT THE ADDED JUMPER WIRES DO NOT REST AGAINST ANY PROTRUDING IC LEADS AS A SHORT CIRCUIT COULD DEVELOP when the board is hinged into final position. Leave the boards free after this has been completed, until the harness updates are completed in the issuing step.

Replace EPROMS 1 through 3 and add the additional 6116 RAM into the available U8 position.

COMMON ANALOG BOARD #2
Make sure modifications from bulletins 834 and 837 are installed. In addition, install two 90.9K 1% 1/4 watt resistors supplied in place of R155 and R158 (originally 100K 1%).

SEQUENCER BOARD #11
Remove the rear panel knock-out plate and mount the Sequencer Board rear overlay panel by reusing two of the three black Phillips head screws. Mount the Sequencer Board using the exisiting two Keps nuts currently used to mount the Left/Right Side Control Boards. Be sure there is a plastic insulator glued to the mounting bracket as this prevents shorting of the bracket to traces on the control board.

Connect heavy green ground wire of the sequencer board to the large trace marked "U7" immediately in front of U7 on the Digital Board. Scrape away any residual flux with a sharp pointed object, eg. an awl.

HARNESS UPDATE
Reroute the main harness to allow for room for the sequencer board when fully assembled. Follow the diagrams provided. Add the new power supply cable provided by connecting it from the S114 location on the Sequencer Board to the S521 location on the DMUX Board. Be sure wires exit to the left on DMUX board in which the red wire is connected to Pin 2 of S521 and exits AWAY from the jacks on the sequencer board. Route it in with the main harness which crosses the Common Analog board.

Next, remove the brown wire from the red MTA connector at P77-1 on the Left Side Contol Board. Pull the brown wire back through the harness so it exits the harness near the P113 location on the sequencer board. Install the new MTA connector at location S113-2 on the Sequencer Board and attach the new white/brown wire into the MTA connector 77-1 on the Left Side Control Board, using firm pressure from a pair of small needle nose pliers. These insulation displacement connectors may of course be attached using the appropriate AMP tool 59803-1 as shown on page 137 of the Service Manual. The brown wire should be similarly connected into S113-3 on the sequencer board. Lastly, install the 40 pin shielded ribbon cable from the S111 sequencer board socket to the S4X socket on the Digital Board. Note that the polarity stripe must coincide with the socket designation for pin 20.

Separate the Common Analog board power supply harness P26 from the main harness by cutting the tie wraps. Route the P26 UNDER the Digital board and route it UP BETWEEN the Common Analog board and Digital boards and into its final position.

Using the supplied plastic "angular mounting clips", attach them to the left rear corner of the Digital Board AND the left rear corner of Voice Card #1 (A). Both clips should be angled UP and extending out to the LEFT of the appropriate board. The gray shielded cable harness from the Voice Cards to P29 should be reattached with a tie wrap to the new "angular clip" at the left of Voice Card #1(A).

The harness to connector P27 of the Common Analog board should be looped around counter-clockwise to place it into final position (ends up left of the connector). The rest of the main harness bundle will be rerouted along the REAR of the Common Analog and Digital boards. At the left rear corner of the Digital Board the new "angular clip" should be used to tie wrap the main bundle and continue routing it along side the power transformer with the other power transformer cables. The large "ball-type" twist lock is also used at this location to group the power supply P131 harness to the main bundle.

Optionally the following ribbon connectors may be rerouted for ease of calibration in the future. Follow the diagrams provided:
Swap end-for-end P22 and P56, fold and reroute ribbon.
Swap end-for-end P21 and P55, fold and reroute ribbon.
Swap end-for-end P45 and P51, fold and reroute ribbon.
Swap end-for-end P43 and P52, fold and reroute ribbon.

Using the six 0.1uf tubular capacitors supplied, solder one to each of the five rear panel jacks positioned on the left side of the Jack Board (RELEASE, HOLD, PROGRAM ADVANCE, PROGRAM BACK STEP and GLIDE) and the sixth to the FOOT PEDAL jack on the Jack Board (see diagram).

Due to the complexity of the Memorymoog harnessing be sure the various cables are not squeezed against the front panel during final assembly. A cable pushing up on the front panel may cause a number of switches to feel excessively stiff to operate. If this occurs, open the Memorymoog and readjust the harness.

CASSETTE LOADING
According to the customer's instructions, load in either his original presets or the new factory presets provided. In any event, after loading the appropriate 100 presets, proceed to the sequencer portion of the factory tape and following the new Owner's Manual addenda, LOAD the sequence tape by hitting (C,2,ENTER), then when "B IF SEQ" is displayed, hit (B). Remember, hitting ENTER loads the programs.

NAMEPLATE AND OVERLAY INSTALLATION
Add the new Memorymoog Plus nameplate by first carefully removing the old nameplate. Protect the wood with a suitable material and pry up the right hand edge.

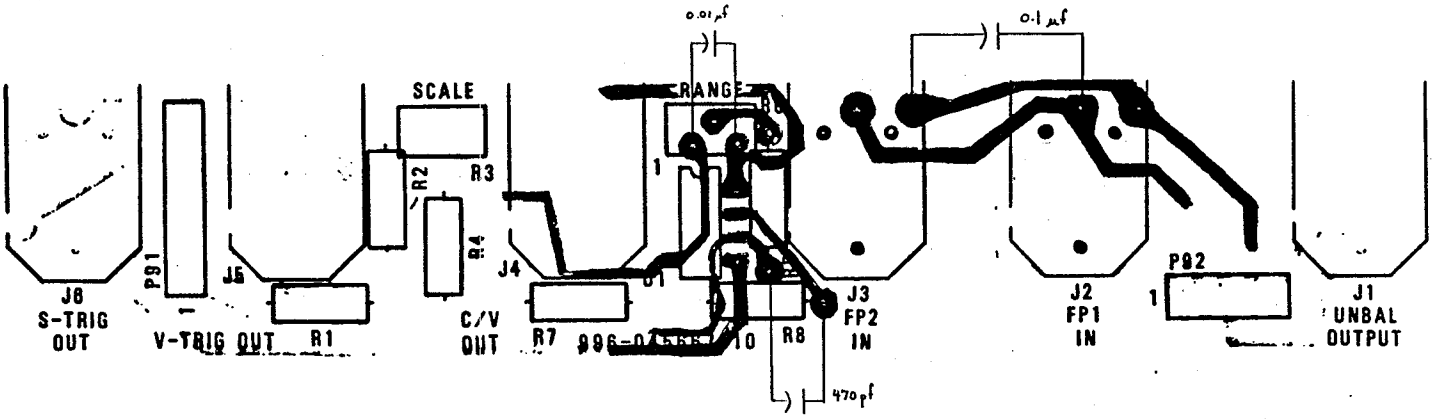
Clean the MODULATION segment of the original overlay to remove any surface contamination (finger oil, etc.) with denatured alcohol. Add the new overlay to the front panel by peeling off the backing material. Hold it at the sides and directly over the original LFO MODULATION overlay. Carefully line up the new overlay over the existing overlay, using a very slight side to side oscillating motion, until it is exactly positioned. Next push down firmly around the LEDs and switches and smooth out the remaining areas, working towards the extremities.

TEST AND REASSEMBLE
Test and adjust the Sequencer Board. The complete test procedure is listed below for future reference.

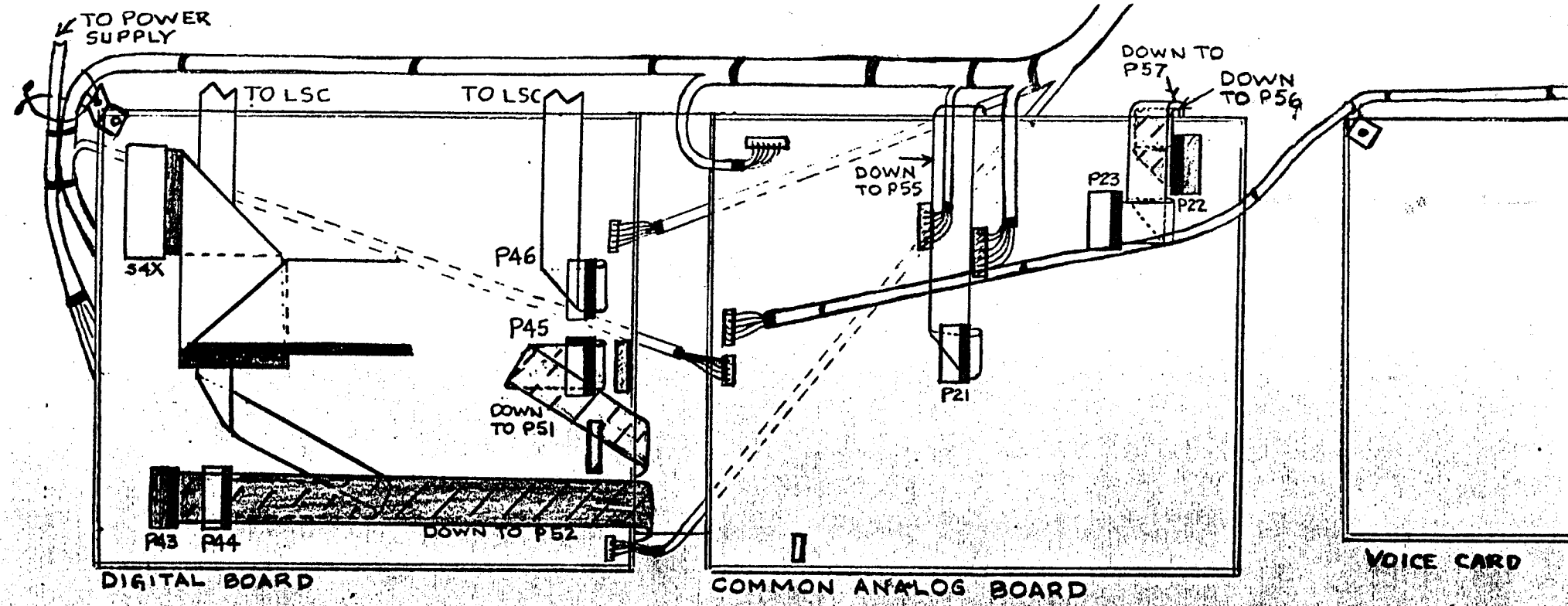
Reassemble in the usual manner, however, use the three (3) blunt phillips-head screws provided for the rear panel. These avoid a possible short circuit to the new harness position.

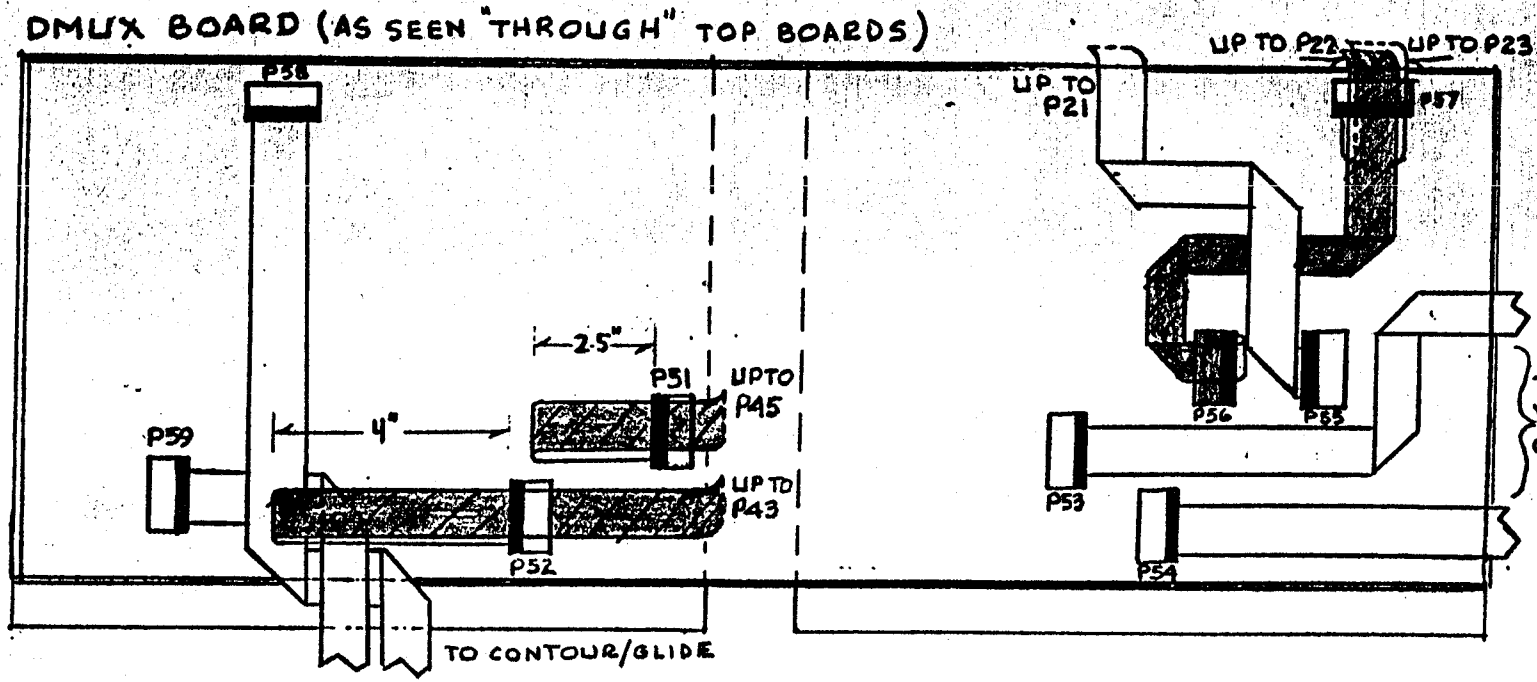
UPDATE DOCUMENTATION
Correct the schematic for: the LSC board new connector designations for the P77-1 to P113 to P25-6, the digital board and common analog board changes. Give the owner the additional owner information and add the provided schematic in with this bulleting to the schematic section of the manual.

OLD EPROMS
PLEASE fill out the enclosed sheet for our computer file. Be sure to mail back the old EPROMs in the envelope enclosed and IN THE ANTISTATIC BAG PROVIDED along with the installation notice to insure an appropriate refund or credit to you or your account.

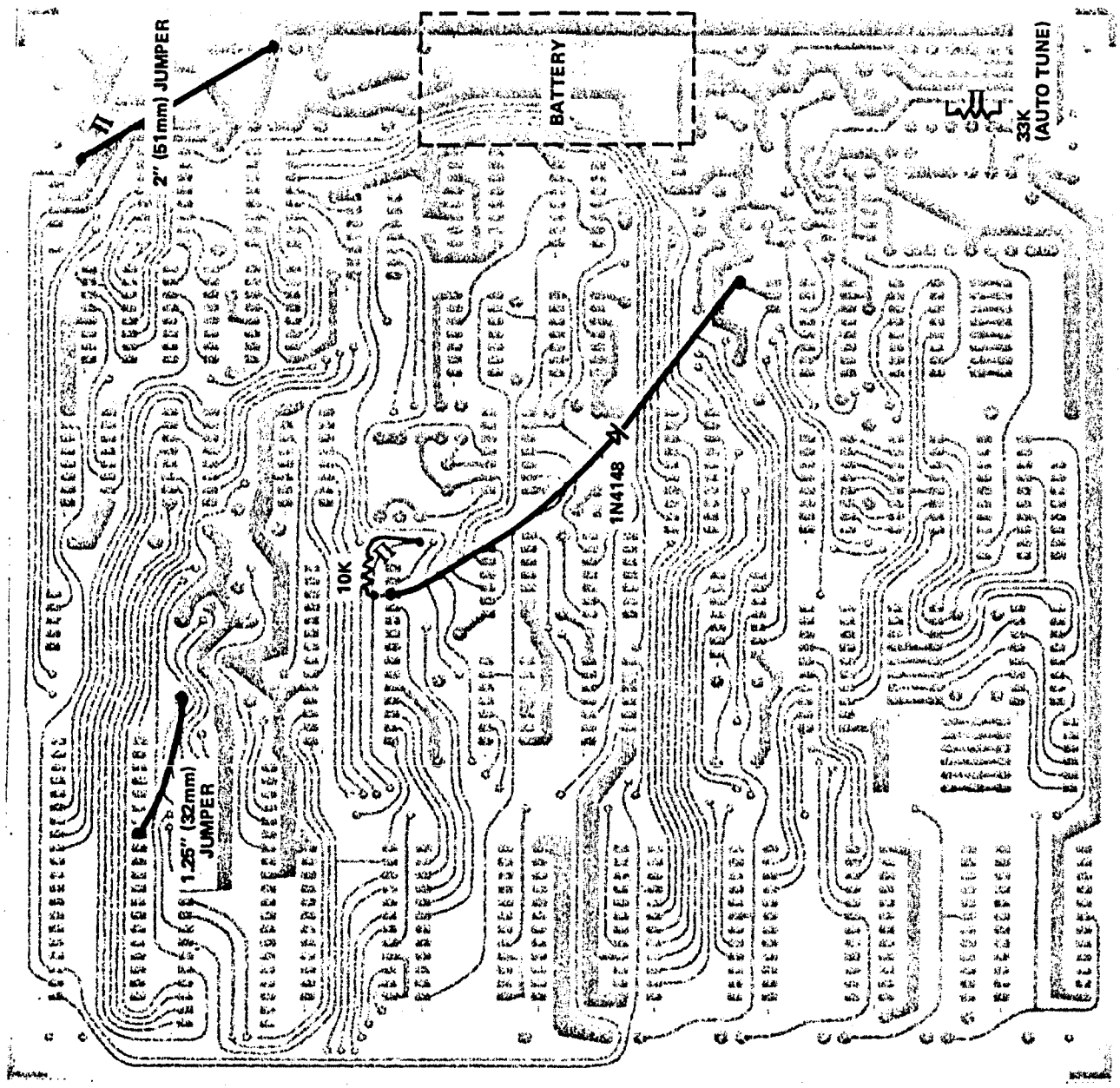


JACK ASSEMBLY PRINTED CIRCUIT BOARD (BOARD NO. 9)





HARNESS UPDATE
1-10-84



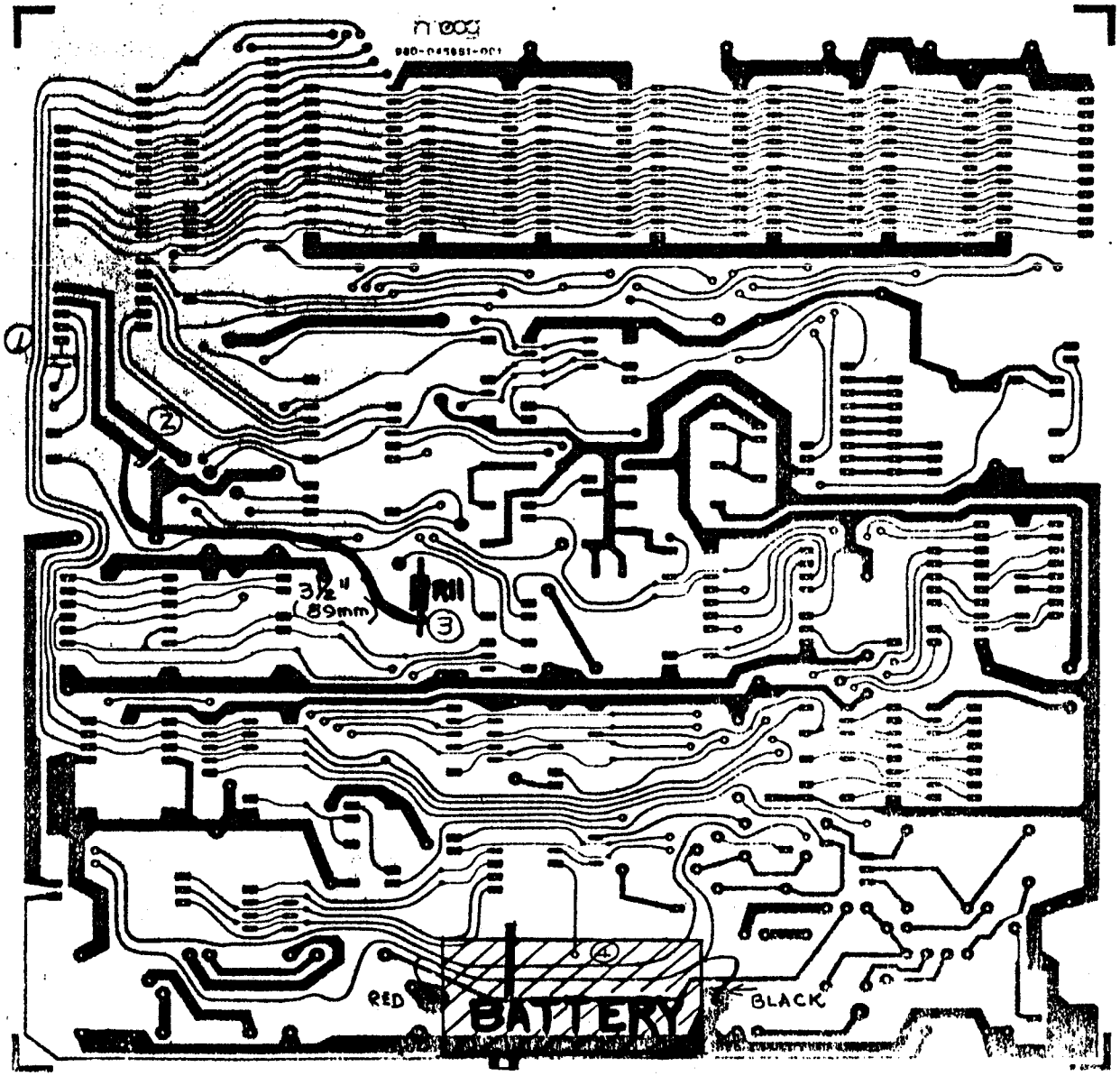
SEQUENCER MODIFICATION
UNDERSIDE OF DIGITAL BOARD NO. 4
OPEN POSITION

SEQUENCER RETROFIT

Underside of Digital Board

"OPEN POSITION"

1. Cut trace from U24 "out" to Pin 2 of S4X.
2. Add 2" jumper to trace from Pin 2 of S4X to VRAM trace at CR4.
3. Add 1.25" jumper from Pin 28 of S4X to plated through hole connected to Pin 17 of U1.
4. Cut trace between Pin 17 of U10 and plated through hole near Pin 15 ~~15~~
5. Add 10K across this trace cut (4 above).
6. Add 1N4148 diode/jumper from Pin 17 of U10 to side of R15 nearest battery.



SEQUENCER RETROFIT

Component Side of Digital Board

"Closed Position"

① Cut trace leading from S4X Pin 20 to plated through hole.

② Cut wide trace from Pin 17 which exits under S4X before it "Y's" to C32 and C23. Verify P17 with an ohmmeter.

③ Add 3½" jumper from bottom of R11 to Pin 17 of S4X

④ Parallel battery leads if necessary.

o MEMORYMOOG SEQUENCER TEST PROCEDURE
Add this procedure following page 146 of the Service Manual

1. Load Cassette Sequences (if necessary) by:
   Hitting C,2,ENTER. Display will momentarily read "C LOAD" and then "B IF SEQ". Hit B to load sequences. Display reads "SEQUENCE" prior to loading of cassette sequences.

2. Enter Sequencer mode:
   Hit C,C,ENTER. Display now reads "SEQUENCE" and the POLY and SEQ LEDs should be ON. If the display reads "*MOOG*" just hit C,C,ENTER again to "toggle" the display to read "SEQUENCE".

   NOTE: C,C,ENTER switch action enters or exits the sequencer mode.

3. Sequencer RATE calibration:
   Hit SEQ/MRG1, then START.

   Set the front panel RATE control to 50% (12 'clock).

   Connect an oscilloscope or a frequency counter to the side of R26 marked "R26" on the SEQUENCER board. A 10X probe is advisable to prevent loading the rate oscillator resulting in erroneous readings.

   Adjust trim R47 for 2918 Hz (342us) to 3226 Hz (310us) nominally 3072 Hz (325us) if necessary.
   Hit STOP.

4. Sequencer jack test:
   Connect a footswitch to the CLOCK IN jack, and set the rear panel CLOCK RATE switch to the STEP position. Footswitch operation may be simulated by means of a 1/4" guitar cord connected to a normally open momentary switch.

   Hit SEQ/MRG1, then START.

   Depress the footswitch several times to partially step through the sequence and verify by using the audio output. Disconnect footswitch.

   Hit STOP, then START.

   Reconnect the footswitch to the CLOCK DISABLE jack and connect an oscilloscope to the CLOCK OUT jack. Verify a +5 volt pulse with a nominal duty cycle equal to 100 USEC. Verify that the clock is disabled when the footswitch is depressed. Disconnect footswitch and oscilloscope.

   Hit STOP.

   Next connect the footswitch to the START/STOP jack. Depress footswitch to START the playback of sequence 1.

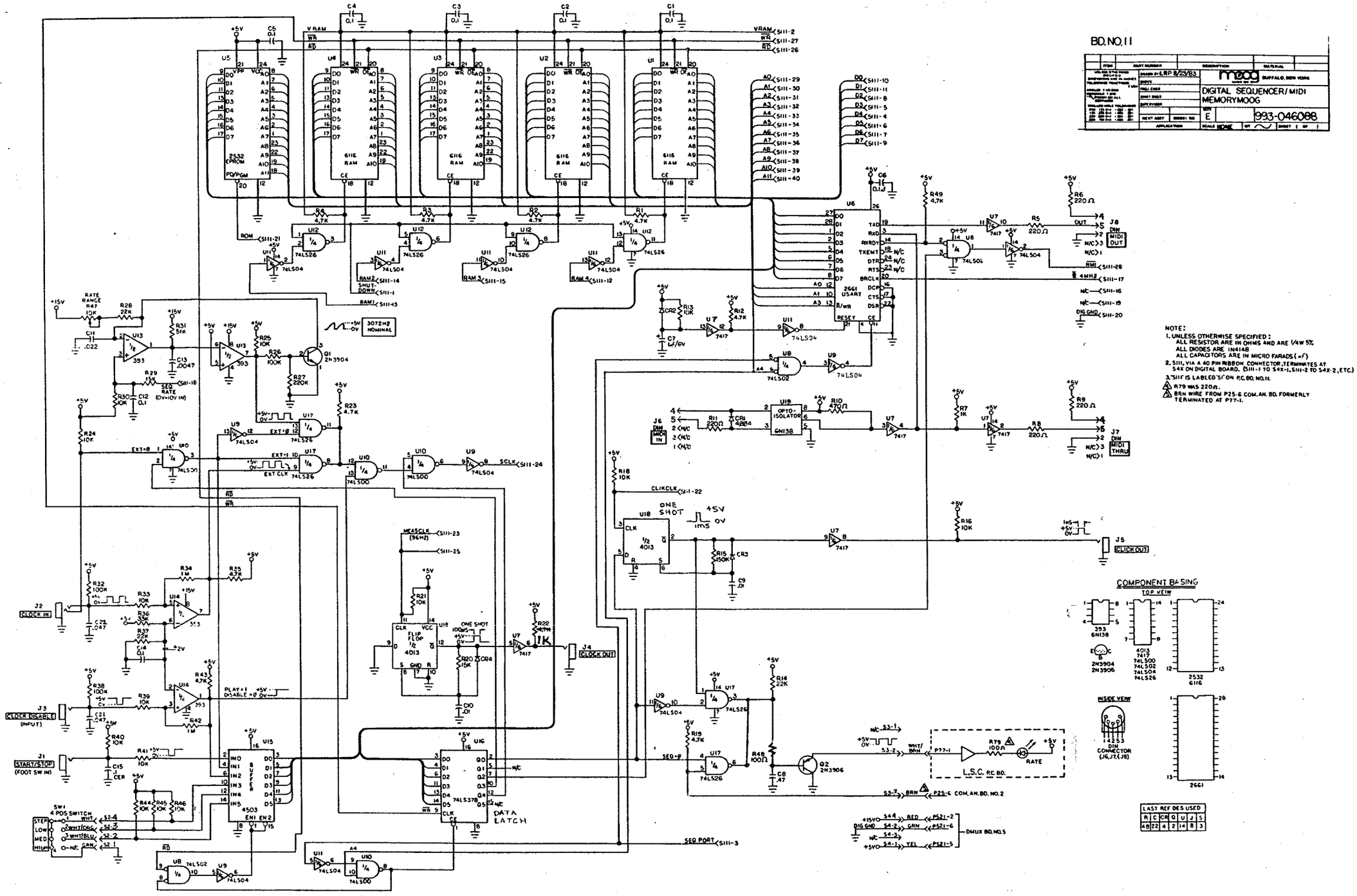
   Connect an oscilloscope to the CLICK OUT jack and verify a +5 volt pulse with a nominal 1msec. duty cycle.

   Depress footswitch to STOP playback.

   Disconnect footswitch and oscilloscope and the test is completed.

996-046090-901 SEQUENCER BOARD #11

REF DES (QTY)	PART NUMBER	DESCRIPTION	TYPE/USE
(1)	913-045588-007	OVERLAY, 6.9 X 7.8", SEQUENCER	FRONT PANEL
(1)	963-046094-001	REAR PANEL, SEQUENCER, ALUMINUM	INTERFACE PANEL
(2)	904-041406-010	WASHER, FIBER #6 X 5/16" OD	REAR PANEL
(2)	902-041450-001	NUT, HEX, 2MM ZINC, METRIC	SWITCH MOUNTING
(2)	903-041449-001	MACHINE SCREW, 2MM X 5MM, METRIC	SWITCH MOUNTING
(2)	904-040495-001	WASHER, LOCKING, #2 NICKEL	SWITCH MOUNTING
(1)	910-046058-003	HEADER, CIS, .1" CTRS. LOCKING	3 PIN
(2)	910-046058-004	HEADER, CIS, .1" CTRS. LOCKING	4 PIN
(1)	910-045895-004	HOUSING, MTA, RED	4 PIN 22 AWG
C1-C6	947-045183-104	CAP,CERAMIC, MONOLITHIC 20% 50V	.01 UFD
C7	945-044465-005	CAP,ALUM ELECTRO +80% -20% 50V	1 UFD
C8	946-041978-474	CAP,POLYESTER FILM 10% 50V	.47 UFD
C9-C10	947-045011-103	CAP,CERAMIC TUBULAR +80% -20% 50V	.01 UFD
C11	946-041978-223	CAP,POLYESTER FILM 10% 50V	.022 UFD
C12	946-041978-472	CAP,POLYESTER FILM 10% 50V	.1 UFD
C13	947-045008-472	CAP,TUBULAR 10% 50V	.0047 UFD
C14-C15	946-041978-104	CAP,POLYESTER FILM 10% 50V	.1 UFD
C16-C20	947-045183-104	CAP,MONOLITHIC, CERAMIC 20% 50V	.1 UFD
C21-C22	946-041978-473	CAP,POLYESTER FILM 10% 50V	.047 UFD
CR1-CR4	919-041075-001	DIODE, SIGNAL, SILICON	IN4148
J1	910-045552-001	RIGHT ANGLE JACK, PHONE 2 COND	START/STOP
J2	910-045552-004	RIGHT ANGLE JACK, PHONE 3 COND	CLOCK IN
J3	910-045552-001	RIGHT ANGLE JACK, PHONE 2 COND	CLOCK DISABLE
J4	910-045552-001	RIGHT ANGLE JACK, PHONE 2 COND	CLOCK OUT
J5	910-045552-001	RIGHT ANGLE JACK, PHONE 2 COND	CLICK OUT
J6	910-046093-005	RIGHT ANGLE DIN CONN 5 PIN DIN	MIDI IN
J7	910-046093-005	RIGHT ANGLE DIN CONN 5 PIN DIN	MIDI THRU
J8	910-046093-005	RIGHT ANGLE DIN CONN 5 PIN DIN	MIDI OUT
Q1	991-041051-002	TRANSISTOR, NPN, SMALL SIGNAL	2N3904
Q2	991-041052-002	TRANSISTOR, PNP, SMALL SIGNAL	2N3906
U1-U4	991-045530-001	IC,CMOS, STATIC RAM, 2K X 8 RET	6116
U5	991-045307-001	IC,NMOS, MEMORY PROM	2532
U6	991-046091-001	IC,USART,INTERFACE	2661B
U7	991-045900-017	IC,TTL, HEX BUFFER, 15V OPEN	7417
U8	991-045900-002	IC,TTL, QUAD 2 INPUT NOR	74LS02
U9	991-045900-004	IC,TTL, HEX INVERTER	74LS04
U10	991-045950-000	IC,TTL, QUAD 2 INPUT NAND	74LS00
U11	991-045950-004	IC,TTL, HEX INVERTER	74LS04
U12	991-045950-026	IC,TTL, QUAD 2 INPUT NAND 30VDC	74LS26
U13-U14	991-042388-001	IC,DUAL VOLTAGE COMPARATOR	LM393
U15	991-045960-503	IC,CMOS, HEX 3 STAGE BUFFER	4503
U16	991-045950-378	IC,TTL, HEX D FLIP FLOP	74LS378
U17	991-045950-026	IC,TTL, QUAD 2 INPUT NAND 30 VDC	74LS26
U18	991-045960-013	IC,CMOS, DUAL TYPE D FLIP FLOP	4013
U19	991-046092-001	IC,OPTO ISOLATOR, FAST DARLINGTON	6N138
(1)	960-046098-001	SWITCH, SLIDE, 1P6T	SPEED SELECTOR
(1)	960-046098-101	SWITCH KNOB	SPEED SELECTOR
(6)	960-046098-002	SWITCH BUTTON, GRAY PLAIN	SEQ. VARIOUS
(1)	964-044082-102	SWITCH BUTTON, GRAY #1	SEQ. LOC. #
(1)	964-044082-104	SWITCH BUTTON, GRAY #2	SEQ. LOC. #
(1)	964-044082-105	SWITCH BUTTON, GRAY #3	SEQ. LOC. #
(1)	964-044082-106	SWITCH BUTTON, GRAY #4	SEQ. LOC. #
(1)	964-044082-107	SWITCH BUTTON, GRAY #5	SEQ. LOC. #
(1)	964-044082-108	SWITCH BUTTON, GRAY #6	SEQ. LOC. #
RXX	852-312XXX-001	RESISTOR, 1/4 WATT 5% CARBON FILM	VARIOUS
RXX	853-42XXXX-031	RESISTOR, 1/4 WATT 1% METAL FILM RESISTANCE (XXX) (X) MULTIPLIER	VARIOUS
S1	994-046099-002	RIBBON CABLE, 40 PIN TO S4X	DIG.BD.INTERFACE
S2	996-046090-961	SWITCH CABLE - 4 WIRE MTA	SPEED SELECTOR
S3	994-045894-964	MOD/SEQUENCER LED RATE CABLE	C/A & LSC BDS.
S4	994-045894-998	POWER SUPPLY CABLE SEQUENCER	DMUX P521


BD.NO.11
moog
BUFFALO, NEW YORK
DIGITAL SEQUENCER/MIDI
MEMORYMOOG
993-046086
NOTE:
1. UNLESS OTHERWISE SPECIFIED :
ALL RESISTOR ARE IN OHMS AND ARE 1/4W 5%
ALL DIODES ARE 1N4148
ALL CAPACITORS ARE IN MICRO FARADS(mF)
2. S111 VIA A 40 PIN RIBBON CONNECTOR.TERMINATES AT S4X ON DIGITAL BOARD. (S111-1 TO S4X-1,S111-2 TO S4X-2,ETC.)
3."S111" IS LABLED"S1" ON P.C.BD. NO.11.
A R79 WAS 220Ω.
B BRN WIRE FROM P25-6 COM.AN. BD. FORMERLY TERMINATED AT P77-1.
COMPONENT BASING
TOP VIEW
INSIDE VIEW
LAST REF DES USED
R C CR Q U J S
48 22 4 2 14 8 3
SEQ PORT S111-3
CLOCK OUT J5
CLOCK OUT J4
CLOCK IN J2
CLOCK DISABLE (INPUT) J3
START/STOP (FOOT SW IN) J1
MIDI IN J6
MIDI THRU J7
MIDI OUT J8
L.S.C. P.C. BD.
DMUX BD.NO.5
DATA LATCH
SEQUENCE RATE (0V=10V IN)
RATE RANGE
3072HZ NOMINAL
4 POS.SWITCH
STEP
LOW
MED
HIGH

SEQUENCER/MIDI BOARD #11

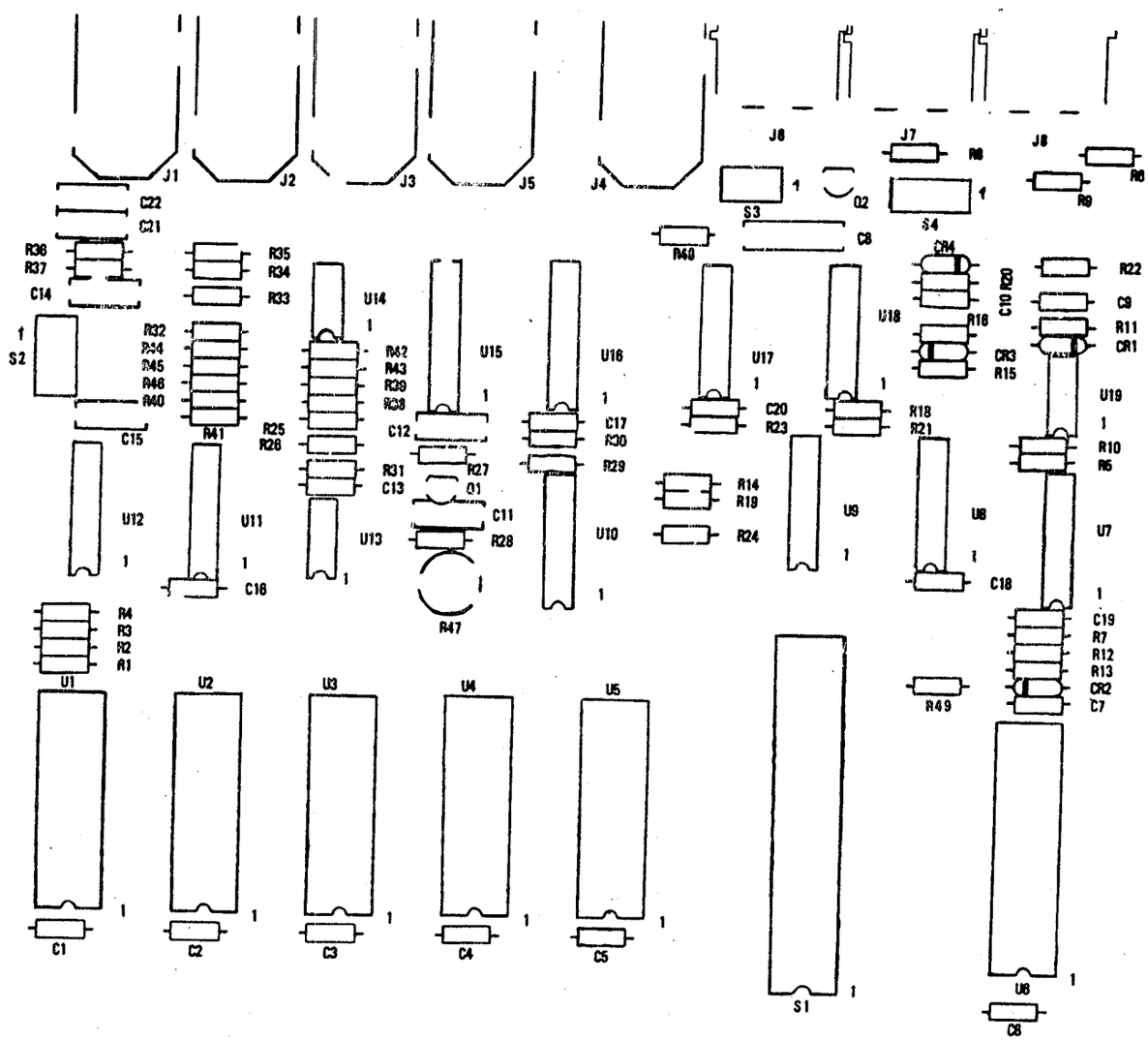
CONNECTOR CHART & ASSEMBLY DRAWING

NEW CONNECTOR CONFIGURATION

ORIGINATION	DESTINATION	FUNCTION	COLOR/TYPE
COMMON ANALOG BOARD #2			
P25-1	P77-2	TUNE	GRAY
P25-2	P64-5	HEADPHONE RETURN	CLEAR
P25-3	P64-6	SHIELD	SHIELD
P25-4	P64-8	VOLUME OUT	ORANGE
P25-5	-----	N/C	-----
P25-6	P113-3	SEQUENCER MOD RATE	BROWN
P26-7	P64-7	MASTER VOLUME RETURN	BLACK
DIGITAL BOARD #4			
S4X- 1	S111- 1	SHUTDOWN	RIBBON
S4X- 2	S111- 2	V-RAM	RIBBON
S4X- 3	S111- 3	SEQ PORT	RIBBON
S4X- 4	S111- 4	D4	RIBBON
S4X- 5	S111- 5	D3	RIBBON
S4X- 6	S111- 6	D5	RIBBON
S4X- 7	S111- 7	D6	RIBBON
S4X- 8	S111- 8	D2	RIBBON
S4X- 9	S111- 9	D7	RIBBON
S4X-10	S111-10	D0	RIBBON
S4X-11	S111-11	D1	RIBBON
S4X-12	S111-12	RAM4 (ACTIVE LOW)	RIBBON
S4X-13	S111-13	RAM1 (ACTIVE LOW)	RIBBON
S4X-14	S111-14	RAM2 (ACTIVE LOW)	RIBBON
S4X-15	S111-15	RAM3 (ACTIVE LOW)	RIBBON
S4X-16	N/C	+5 VOLTS	RIBBON
S4X-17	S111-17	4 MHz CLOCK	RIBBON
S4X-18	S111-18	SEQ RATE	RIBBON
S4X-19	N/C	-15 VOLTS	RIBBON
S4X-20	S111-20	DIGITAL/GROUND PLANE	RIBBON
S4X-21	S111-21	ROM	RIBBON
S4X-22	S111-22	CLIK CLK	RIBBON
S4X-23	S111-23	MEAS CLK (96Hz)	RIBBON
S4X-24	S111-24	S CLK	RIBBON
S4X-25	S111-25	MEAS CLK (96Hz)	RIBBON
S4X-26	S111-26	RD (ACTIVE LOW)	RIBBON
S4X-27	S111-27	WR (ACTIVE LOW)	RIBBON
S4X-28	S111-28	NMI (ACTIVE LOW)	RIBBON
S4X-29	S111-29	A0	RIBBON
S4X-30	S111-30	A1	RIBBON
S4X-31	S111-31	A2	RIBBON
S4X-32	S111-32	A3	RIBBON
S4X-33	S111-33	A4	RIBBON
S4X-34	S111-34	A5	RIBBON
S4X-35	S111-35	A6	RIBBON
S4X-36	S111-36	A7	RIBBON
S4X-37	S111-37	A8	RIBBON
S4X-38	S111-38	A9	RIBBON
S4X-39	S111-39	A10	RIBBON
S4X-40	S111-40	A11	RIBBON
DMUX BOARD #5			
P521-1	N/C	ANALOG GROUND	-----
P521-2	S114-4	+15 VOLTS	RED
P521-3	N/C	-15 VOLTS	-----
P521-4	N/C	N/C	-----
P521-5	S114-1	+5 VOLTS	YELLOW
P521-6	S114-2	DIGITAL GROUND	GREEN

LSC BOARD #7

P77-1	P113-2	MOD RATE LED	WHITE/BROWN
P77-2	P25-1	TUNE	GRAY
P77-3	P516-5	+15 VOLTS	RED
P77-4	P516-7	-15 VOLTS	BLACK
P77-5	P516-6	+5 VOLTS RAW	WHITE/YELLOW
P77-6	P516-8	+5 VOLTS	YELLOW
P77-7	P516-10	DIGITAL GROUND	GREEN
P77-8	P516-3	ANALOG GROUND	WHITE/GREEN
SEQUENCER BOARD #11			
S111-1 THRU 40	SX4-1 THRU 40	SEE DIGITAL BOARD #4	RIBBON
S112-4	SW1-1	STEP	WHITE
S112-3	SW1-2	96	WHITE/ORANGE
S112-2	SW1-3	192	WHITE/BLUE
S112-1	SW1-4	GROUND (384)	GREEN
S113-3	P25-6	MOD RATE LED	BROWN
S113-2	P77-1	MOD RATE LED	WHITE/BROWN
S113-1	N/C	----	----
S114-4	P521-2	+15 VOLTS	RED
S114-3	P521-6	DIGITAL GROUND	GREEN
S114-2	N/C	(-15 VOLTS)	----
S114-1	P521-5	+5 VOLTS	YELLOW



Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOG NOISE SOURCE — BULLETIN: 842A
Kit Part Number 997-044697-001

DATE: January 18, 1984

SYMPTOM: Standard noise source exhibits a cyclic "heartbeat" sound.

CAUSE: Inherent design of the 5837 Noise Source integrated circuit. New 5437 IC significantly lengthens the time between cycles.

CURE: FOR UNITS WITH MONO BUFFER BOARD DO THE FOLLOWING:

Remove the buffer board using the IC location shown on the Buffer Board and cut traces leading to pins 2, 4 and 7. Jumper pins 3 and 6 to pin 8. Cut (3) three 5.5 inch (140mm) jumper wires. Solder all wires from the trace side of the Buffer Board as outlined in the table below to the 8 pin Dip Header and thread them through the unused hole in the buffer board for strain relief:

Color	Buffer Board Connector	U25 DIP Header	Function
Blue	Pin 1	Pin 3	Output
Black	Pin 4	Pins 1 & 2	Ground
Red	Pin 3	Pin 4	V+

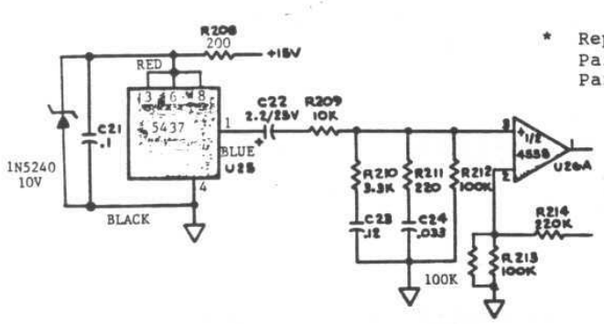
Solder the 5437 into the buffer board.

Remove U25 (5837) from the Common Analog Board and insert 8 pin DIP header (Pin 1 - black wire). Mount the buffer board to the Common Analog Board.*

UNITS WITHOUT BUFFER BOARD MODIFICATION:

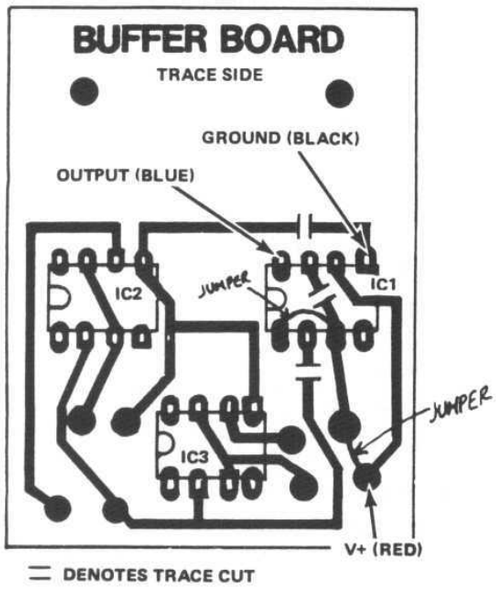
Mount the Buffer Board from the kit as shown. Remove U25 (5837) from the common Analog and insert the 8 pin DIP header in which pin 1 is the black wire. An excerpt from Bulletin 840 is included to add the MONO filter tracking if desired by the customer.

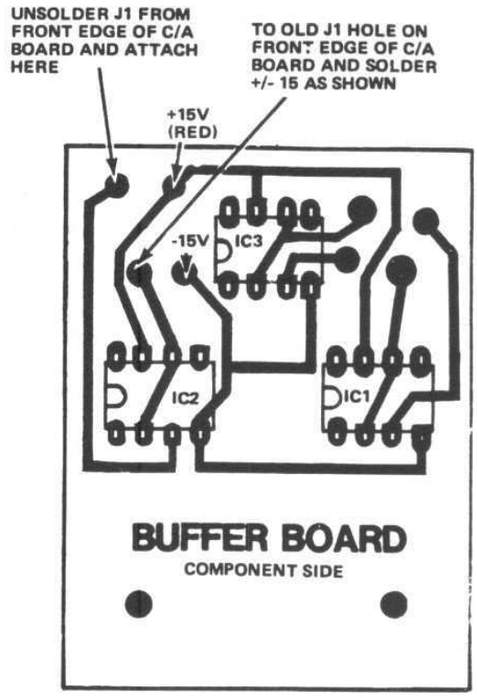
LABOR: This is a non-warranty update especially desirable for studio musicians. The estimated installation time for the noise source alone is 15 minutes. With the MONO filter tracking update, add an additional 30 minutes.

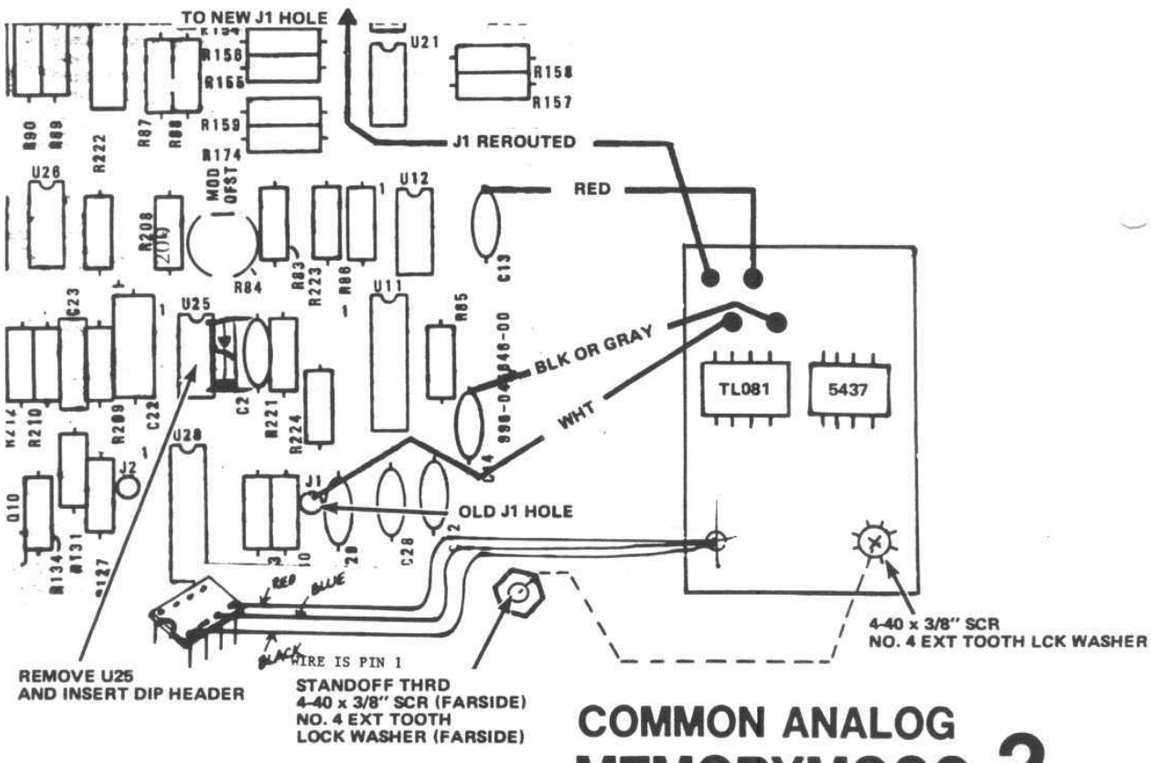


* Replace R208 with 200 ohm 1/4 watt resistor.
Parallel C21 with 500 milliwatt 10V zener 1N5240.
Parallel R213 with a 100K 1/4 watt resistor.

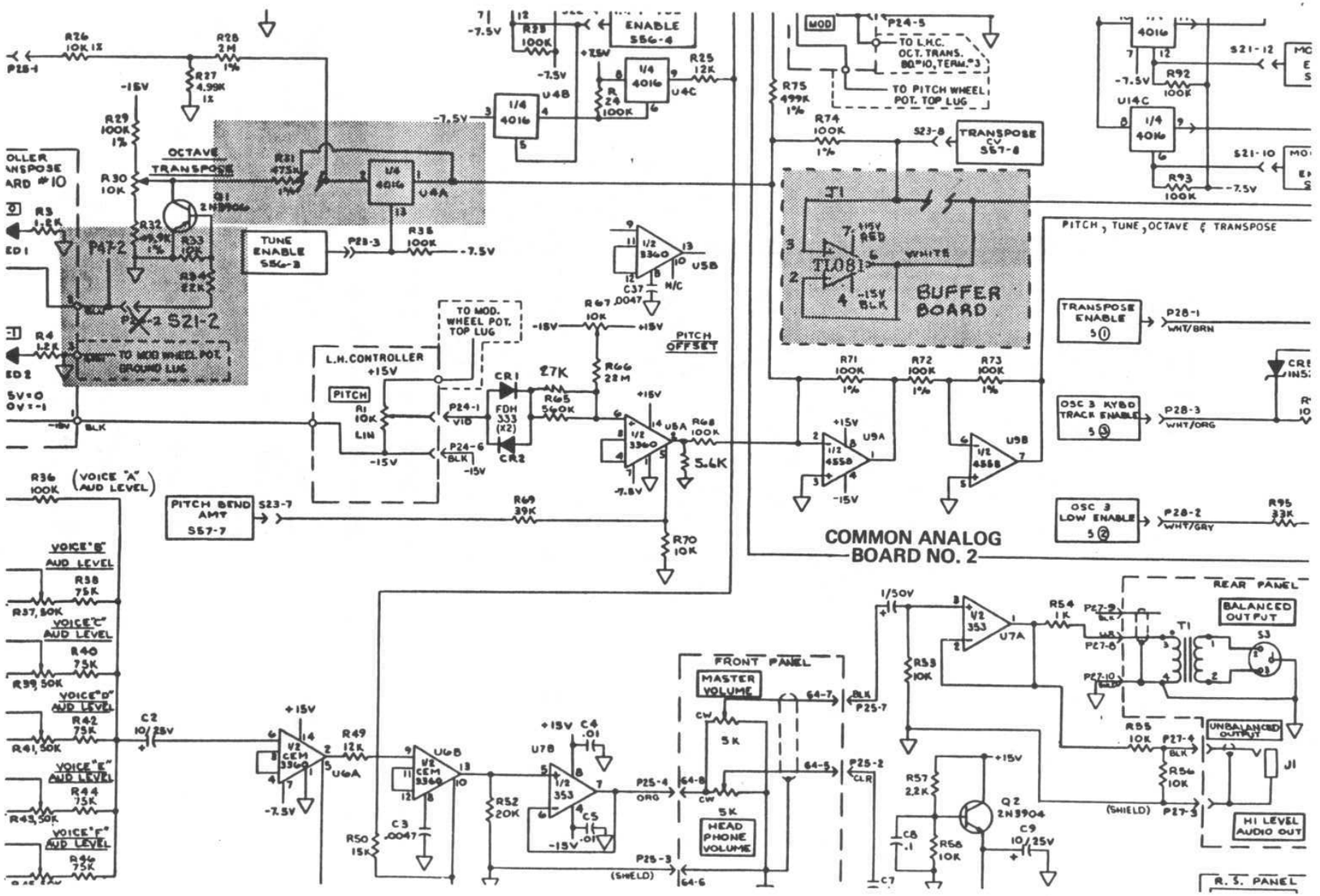
moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.

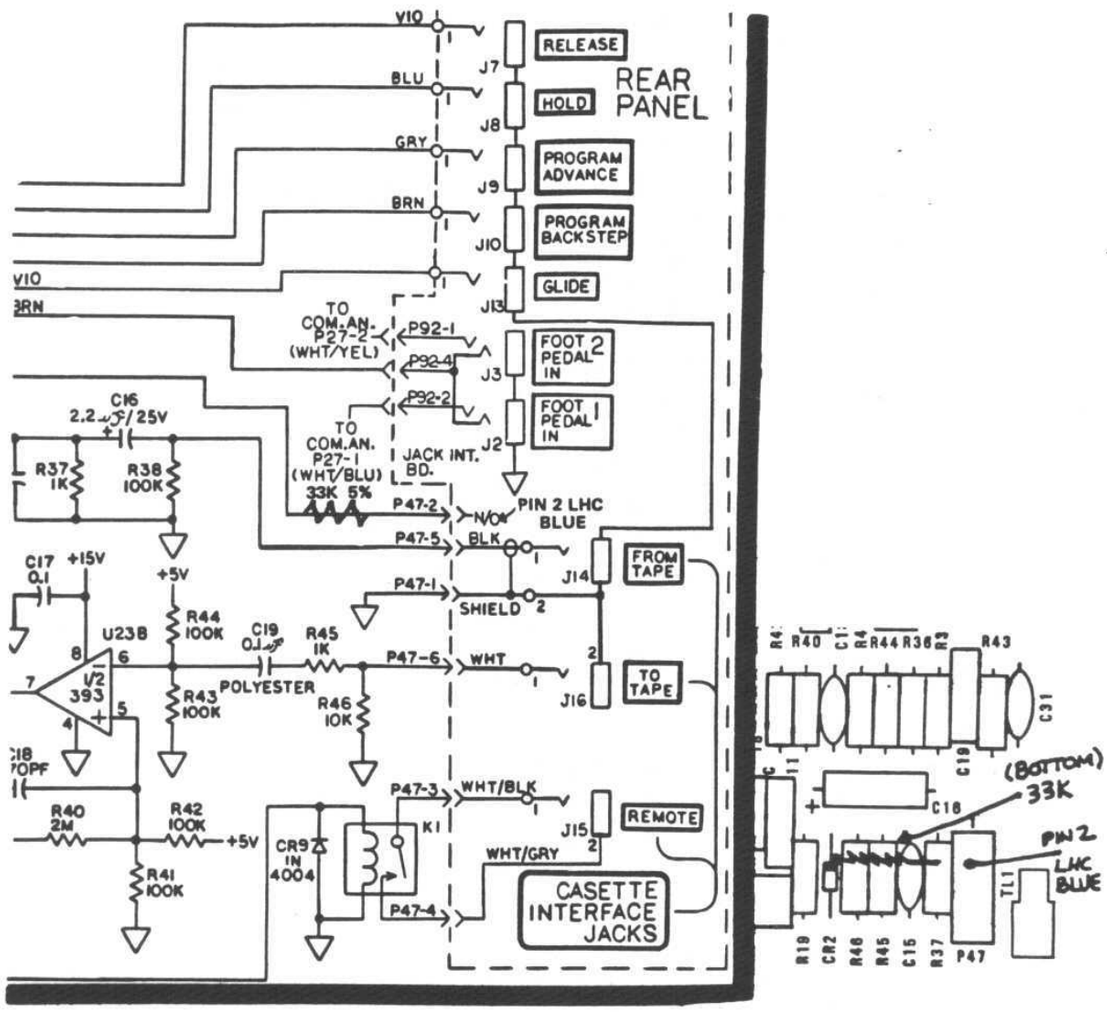


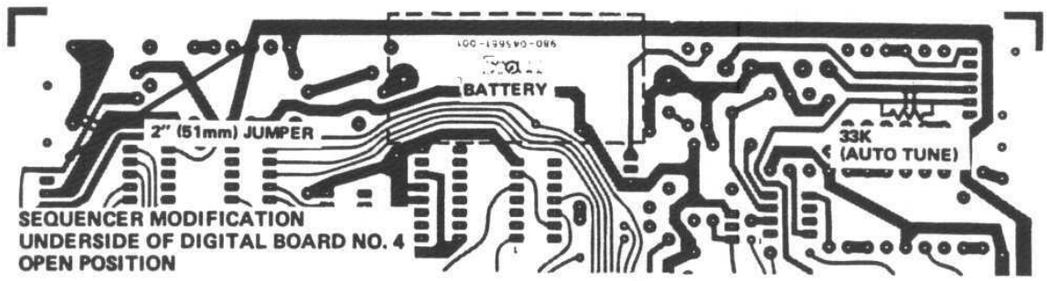

UNSOLDER J1 FROM FRONT EDGE OF C/A BOARD AND ATTACH HERE
TO OLD J1 HOLE ON FRONT EDGE OF C/A BOARD AND SOLDER +/- 15 AS SHOWN
+15V (RED)
-15V
IC3
IC2
IC1
BUFFER BOARD
COMPONENT SIDE



COMMON ANALOG MEMORYMOOG 2


COMMON ANALOG BOARD NO. 2
BUFFER BOARD
TL081
OCTAVE TRANSPOSE
TUNE ENABLE S56-3
ENABLE S56-4
TRANSPOSE CV S57-8
PITCH, TUNE, OCTAVE & TRANSPOSE
TRANSPOSE ENABLE
OSC 3 KYBD TRACK ENABLE
OSC 3 LOW ENABLE
PITCH OFFSET
L.H.CONTROLLER +15V
PITCH BEND AMT S57-7
TO MOD. WHEEL POT. TOP LUG
TO MOD WHEEL POT. GROUND LUG
TO L.H.C. OCT. TRANS. BD. #10, TERM. #3
TO PITCH WHEEL POT. TOP LUG
VOICE "A" AUD LEVEL
VOICE "B" AUD LEVEL
VOICE "C" AUD LEVEL
VOICE "D" AUD LEVEL
VOICE "E" AUD LEVEL
VOICE "F" AUD LEVEL
FRONT PANEL
MASTER VOLUME
HEAD PHONE VOLUME
REAR PANEL
BALANCED OUTPUT
UNBALANCED OUTPUT
HI LEVEL AUDIO OUT
R. S. PANEL





SEQUENCER MODIFICATION
UNDERSIDE OF DIGITAL BOARD NO. 4
OPEN POSITION

DENOTES TRACE CUT

DIGITAL MEMORYMOOG 4

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOG NOISE SOURCE — BULLETIN: 842 A
Kit Part Number 997-044697-001

DATE: January 18, 1984

SYMPTOM: Standard noise source exhibits a cyclic "heartbeat" sound.

CAUSE: Inherent design of the 5837 Noise Source integrated circuit. New 5437 IC significantly lengthens the time between cycles.

CURE: FOR UNITS WITH MONO BUFFER BOARD DO THE FOLLOWING:

Remove the buffer board using the IC location shown on the Buffer Board and cut traces leading to pins 2, 4 and 7. Jumper pins 3 and 6 to pin 8. Cut (3) three 5.5 inch (140mm) jumper wires. Solder all wires from the trace side of the Buffer Board as outlined in the table below to the 8 pin Dip Header and thread them through the unused hole in the buffer board for strain relief:

Color	Buffer Board Connector	U25 DIP Header	Function
Blue	Pin 1	Pin 3	Output
Black	Pin 4	Pins 1 & 2	Ground
Red	Pin 3	Pin 4	V+

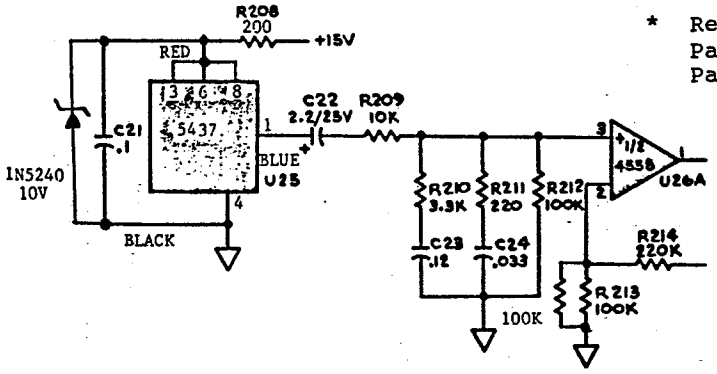
Solder the 5437 into the buffer board.

Remove U25 (5837) from the Common Analog Board and insert 8 pin DIP header (Pin 1 - black wire). Mount the buffer board to the Common Analog Board.*

UNITS WITHOUT BUFFER BOARD MODIFICATION:

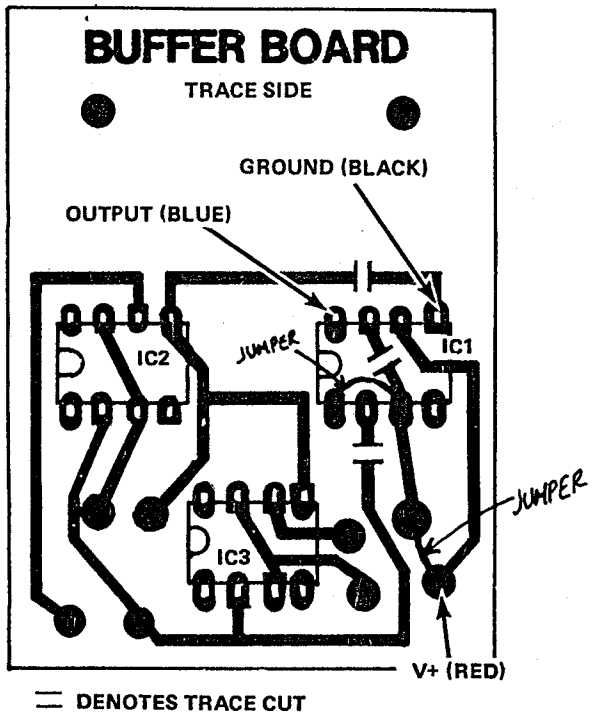
Mount the Buffer Board from the kit as shown. Remove U25 (5837) from the common Analog and insert the 8 pin DIP header in which pin 1 is the black wire. An excerpt from Bulletin 840 is included to add the MONO filter tracking if desired by the customer.

LABOR: This is a non-warranty update especially desirable for studio musicians. The estimated installation time for the noise source alone is 15 minutes. With the MONO filter tracking update, add an additional 30 minutes.

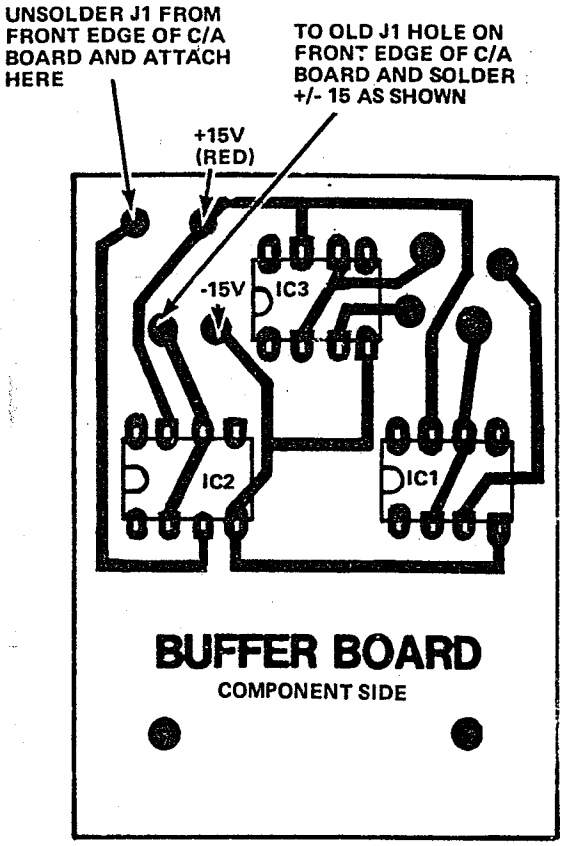


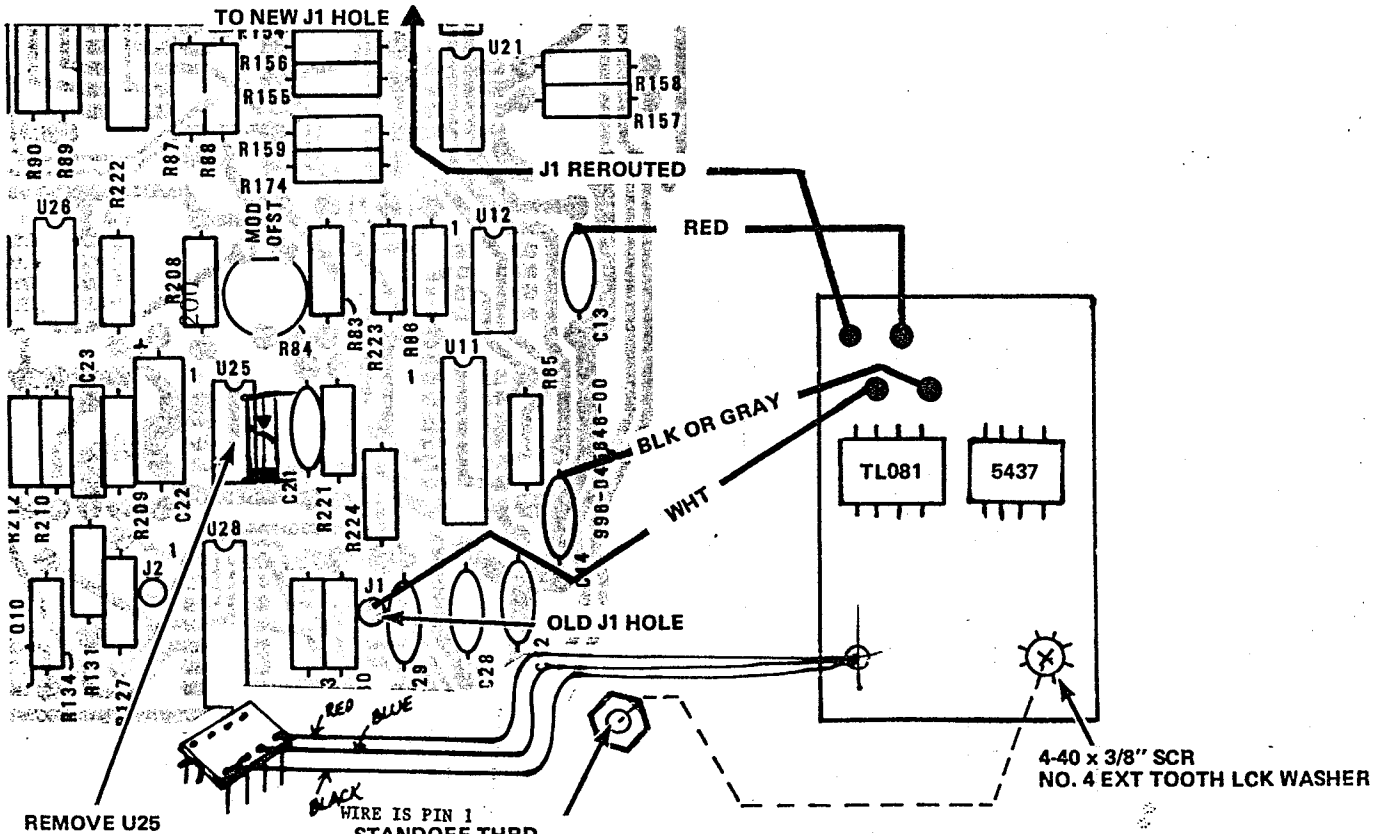
* Replace R208 with 200 ohm 1/4 watt resistor.
Parallel C21 with 500 milliwatt 10V zener 1N5240.
Parallel R213 with a 100K 1/4 watt resistor.

moog® · Gibson® · MAESTRO® · cordovox® · Epiphone® · LABSERIES™ · SG®
Synthesizers Amplifiers Sound Modifiers Accordions Amplifiers Amplifiers Amps



= DENOTES TRACE CUT


UNSOLDER J1 FROM FRONT EDGE OF C/A BOARD AND ATTACH HERE
TO OLD J1 HOLE ON FRONT EDGE OF C/A BOARD AND SOLDER +/- 15 AS SHOWN
+15V (RED)
-15V
IC3
IC2
IC1
BUFFER BOARD
COMPONENT SIDE



COMMON ANALOG MEMORYMOOG 2

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOGS (ALL SERIAL NUMBERS)
MONO/TRANSPOSE/HOLD C.V. MODIFICATION

BULLETIN: 843

DATE: April 10, 1984

SYMPTOM

The unit may display "ZERO TUNED" for an extended period of time when first powered up, requiring several hours to tune all six voices - typically displaying "C7" numbers in the low 40's or 50's and rising as the unit warms up. Normally, the "C7" numbers start high (in the 90's or A's) and drop down to the high 70's or low 80's.

The pitch of the entire keyboard (all 18 oscillators) may rise, drop or drift in pitch.

The above symptoms are prevalent under high humidity conditions.

CAUSE: Flux contamination on: The CONTOUR/GLIDE board near U10 or on the DMUX board near connectors S57 or S58.

VERIFICATION: Place the unit in any polyphonic preset (MONO button OFF) and insure the HOLD button is OFF. On the COMMON ANALOG board #2, measure the D.C. voltage on the front (keyboard) side of R74 (100K 1%). R74 is the 5th resistor to the right of the red MTA connector P24. The measured voltage must be 0 Volts +/-.02 Volts. If an offset voltage greater than this exists, follow the procedure below:

SOLUTION:

1) On the CONTOUR/GLIDE board #3, remove U10 (4016) and bend Pin 3 out parallel to the body of the IC and reinsert it in the socket.

2) Carefully tin the end of U10 Pin 3 using a grounded soldering iron.

3) On the COMMON ANALOG board #2, tin the front end of R74. Cut the trace on the component side of the board between S23 pin 8 and the J1 jumper wire.

4) Tin both ends of a 15" (380mm) insulated jumper wire.

5) Tack-solder one end of the jumper wire to the front end of R74.

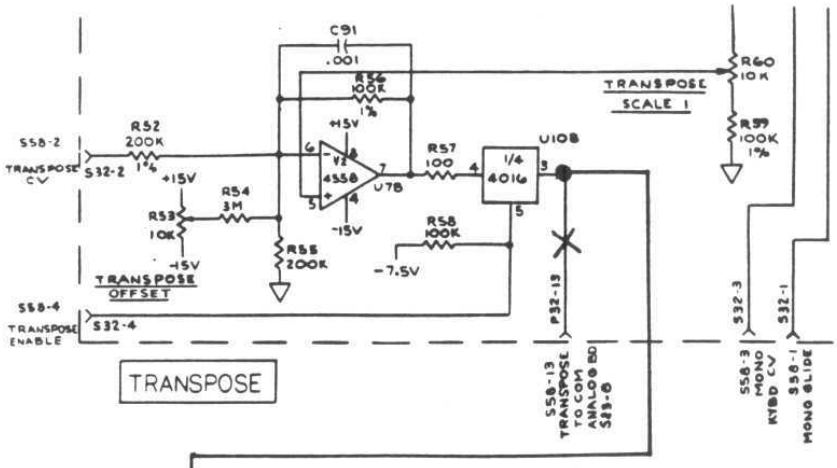
6) Route the wire over the rear end of the COMMON ANALOG board, then run it under the board to the CONTOUR/GLIDE board.

7) On the CONTOUR/GLIDE board, tack-solder the free end of the jumper wire to Pin 3 of U10.

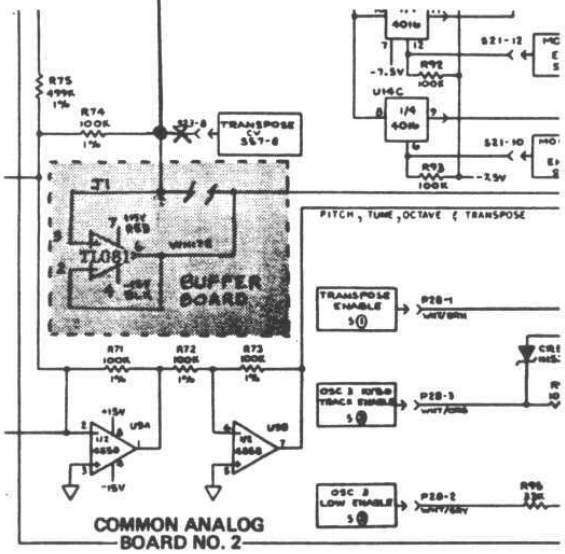
LABOR: This modification should be performed ONLY on an "AS REQUIRED" basis if an offset voltage is found in the VERIFICATION procedure above. It is estimated to take 15 minutes. Moog will reimburse at a FLAT RATE of $10.00.

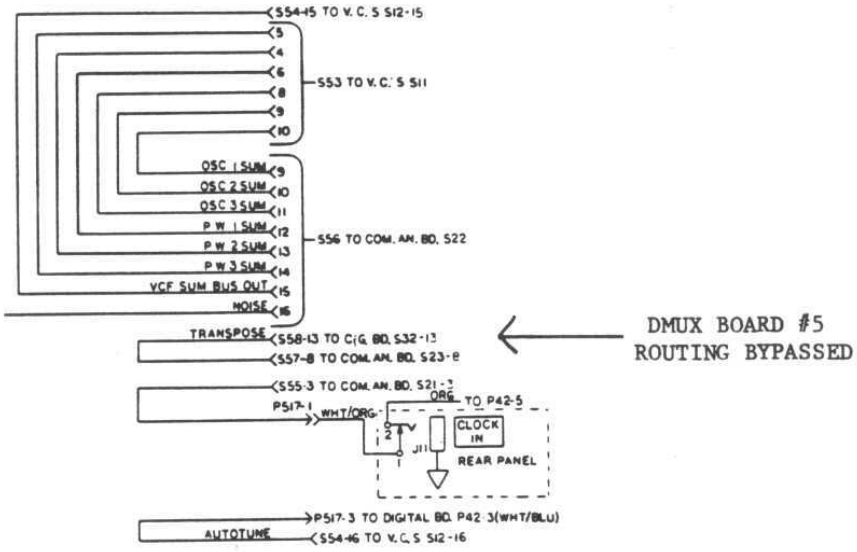
moog® Synthesizers · Gibson® Amplifiers · MAESTRO® Sound Modifiers · cordovox® Accordions · Epiphone® Amplifiers · LABSERIES™ Amplifiers · SG® Amps.

CONTOUR GLIDE
BOARD #3



COMMON ANALOG
BOARD #2





DMUX BOARD #5
ROUTING BYPASSED

Factory Service Bulletin

2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: MEMORYMOOG FAN - ALL SERIAL NUMBERS — BULLETIN: 844
60 Hertz Electromagnetic Radiation
Kit Part Number 997-044698-001

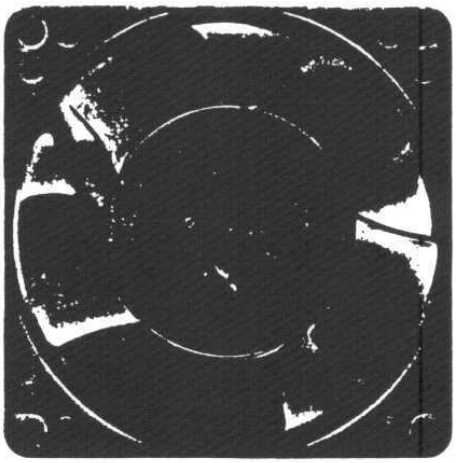
DATE: February 24, 1984

SYMPTOM: When using a Memorymoog in the vicinity of instruments with inductive pickups such as guitars, Fender Rhodes, clavinets, Hammond B3, etc, a noticeable 60 cycle hum can be heard in the output signal of these instruments.

CAUSE: The Memorymoog uses a cooling fan with an open frame motor.

SOLUTION: Replace the standard fan with new "box" version. Remove the Memorymoog cooling fan by removing the four (4) 6-32 x 5/8" fan mounting screws from the base. Cut the two black wires connected to the fan leaving one (1) inch (25mm) of wire attached to the fan. Install the fan adapter plate, part number 963-044700-001, to the base using the existing mounting holes and four (4) 6-32 x 1/4 sems panhead screws, part number 812-045039-004. Observing the air flow arrow stamped on the fan, install the box fan, part number 935-042180-002 to the adapter plate with the arrow down and fan power terminals next to the Digital Board. Secure the fan in place using four (4) 6-32 x 1/4 sems panhead screws. These screws can be tightened using a #0 Phillips screwdriver through the top holes on the fan after adjusting the fan to avoid interference with the transformer. Solder the black wires to the fan power terminals and insulate using electrical tape, heat shrink tubing or RTV silicone rubber.

LABOR. This is a non-warranty customer option update that is estimated to take one (1) hour.



Synthesizers · Amplifiers · Sound Modifiers · Accordions · Amplifiers · Amplifiers · Amps.

Factory Service Bulletin

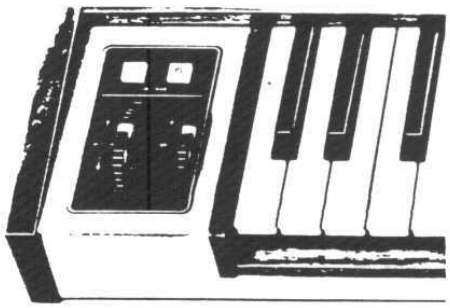
2500 WALDEN AVENUE, BUFFALO, N.Y. 14225 (716) 681-7242
p/a WAALHAVEN Z.Z. 48, 3088 H.J. ROTTERDAM, THE NETHERLANDS

SUBJECT: ALL MOOG PRODUCTS — BULLETIN: 845
SPRING RETURN PITCH WHEEL
Kit Part Number 997-044701-002 Smoked Grey w/serrated edge (For Memorymoog)
997-044701-001 White w/serrated edge (For all other Moog units)

DATE: May 9, 1984

OPTION: This is a non-warranty customer option modification changing the pitch wheel assembly. Installation is estimated to take 1/2 hour. It provides a quick return to zero of the pitch wheel for Memorymoog, Source, Taurus II, Rogue, Minimoog, Micromoog, Multimoog and Opus synthesizers.

PROCEDURE: Remove the existing pitch wheel assembly by removing the hardware securing the assembly to the housing. Transfer the wires from the original wheel assembly to the new one following the same wiring order and install using the original hardware. After installation, use a DVM and electrically center the new wheel to zero volts +/-100mv by loosening the set-screw inside the wheel with a 1/16" Allen driver and turning the pot shaft. Retighten the set screw and verify the wiper voltage is still zero volts.



Synthesizers · Amplifiers · Sound Modifiers · Accordions · Amplifiers · Amplifiers · Amps.

SUBJECT

MEMORYMOOG
ALPHANUMERIC DISPLAY REPLACEMENT
Kit Part Number 997-044704-001

BULLETIN 846

DATE

August 16 1984

DESCRIPTION

This is an improved version of the Memorymoog Display Board containing a daul in-line alphanumeric display package premounted to a display board. It incorporates "self-contained" mounting standoffs to facilitate ease of assembly and disassembly to the Left Side Control Board.

PROCEDURE

Remove the Left Side Control Board (LSC). NOTE On instruments with a display clear board mounted on back of LSC board and having a power supply stiffener brace. the Power Supply may be removed to make the removal of LSC easier. Remove the "1", "2", "3" and "A" push buttons. Carefully unsolder the alpha display from the 22 conductor jumper assembly. Remove the four (4) screws. nuts and washers securing the display board to the LSC board. Unplug the two MTA connectors from the LSC board and remove the Display Board. Straighten any bent pins on the jumper assembly (a new jumper assembly is included in the event the old one is damaged). Assemble one shoulder washer to each of the four (4) 6-32 x 3/8" screws provided (see drawing) and thread them into the LSC board from the solder side until approximately 1/8" protruds through the board Assemble the remaining four (4) shoulder washers to these protruding screws Carefully set the new display board onto the 22 conductor ribbon insuring all 22 conductors are through the board(s). Align the standoffs with the screws and tighten the display board to the LSC board After the display board is tightened down. plug in the two (2) MTA connectors and solder the jumper assembly to the new Display Board (remember to solder the jumper assembly to the LSC board if it was also replaced). Install the push buttons in their proper order and install the LSC board. Turn on the instrument and verify that the displays work correctly Return the old display board to the customer to retain for future repair parts requirements (display driver IC's etc.).

TEST

Insure no characters or segments are unlit. For example observe power up display, potentiometer edit of the noise level and the prompts of (C) (3) (ENTER).

LABOR

This replacement procedure is estimated to take one hour.